

A CHILTON

PUBLICATION

# The Iron Age

UNION BRIGAN

NATIONAL METALWORKING WEEKLY

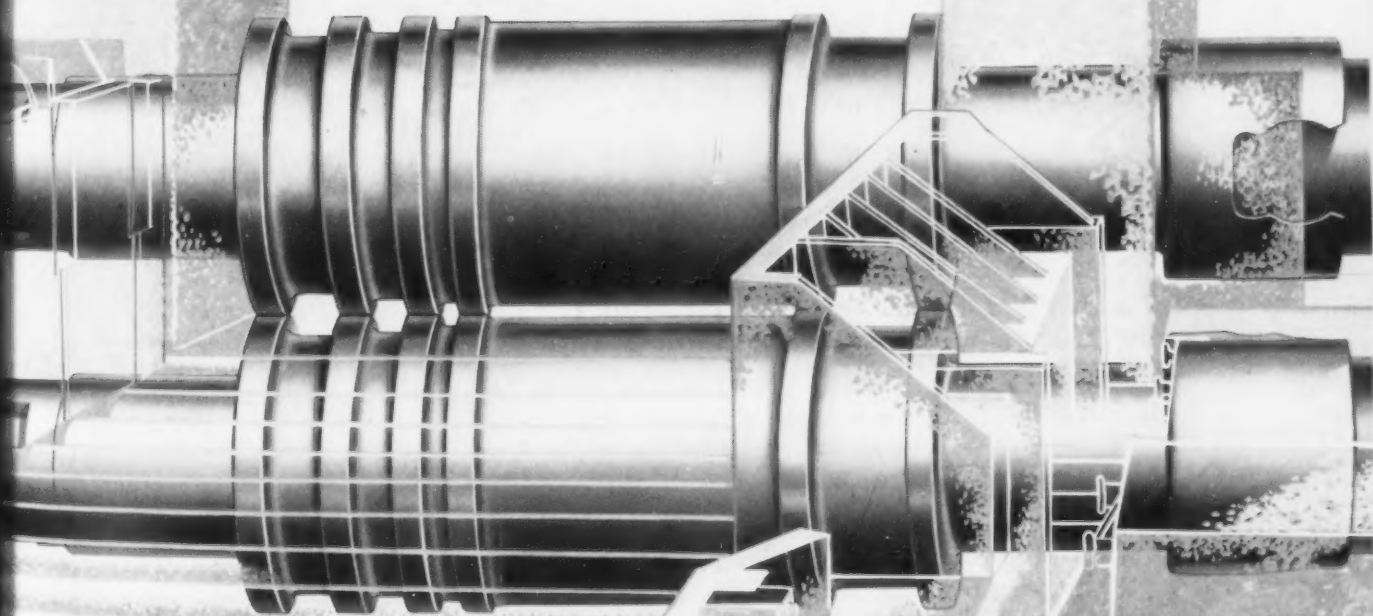
JUN 30 1953

June 25, 1953

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EAST ENGINEERING  
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## Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



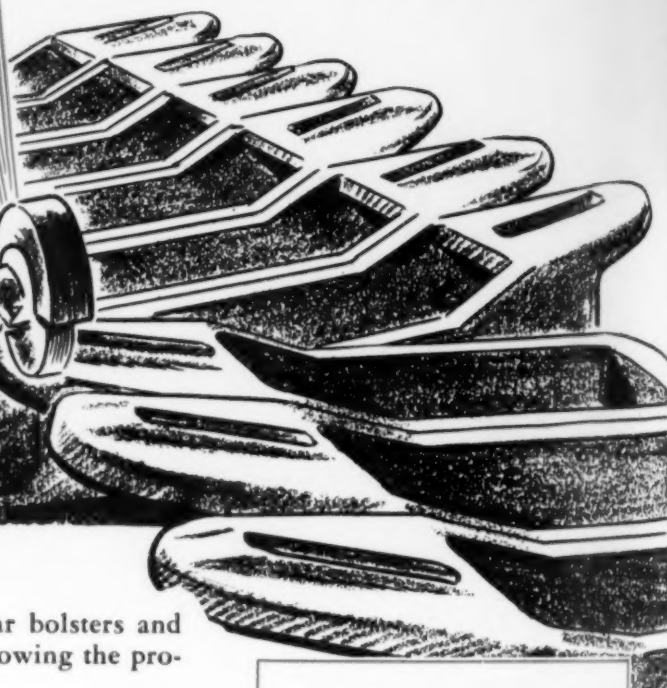
### THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • Plants at Lima and Springfield, Ohio



Production up 26%

with  
**ROTOR GRINDERS**



**A**T this steel foundry, making railway car bolsters and couplers, grinding operations were slowing the production schedule.

**PROBLEM:** Need for more finished pieces per day. Reduction of high wheel cost. Reduction in "down time" of equipment for repairs. Formerly used 8", 13-pound grinders.

**SOLUTION:** Rotor Application Engineer recommended 6", 6,000-rpm Rotor Grinders. Weigh only 9¼ lbs.

**RESULTS:** Production stepped up 26%. Less operator fatigue. Wheels last longer. Finishes are better.

The Rotor Application Engineer can help *you* too. Call or write for Catalog #38.

#### ROTOR GRINDER FACTS

##### SPEEDS

3100 to 21,000 R.P.M.

##### WEIGHTS

4" grinder—8¾ lbs.

6" grinder—9¾ lbs.

8" grinder—11¼ lbs.

##### HANDLES

Straight or Spade.

AIR O'TOOL



**AIR**

**THE ROTOR TOOL CO.**

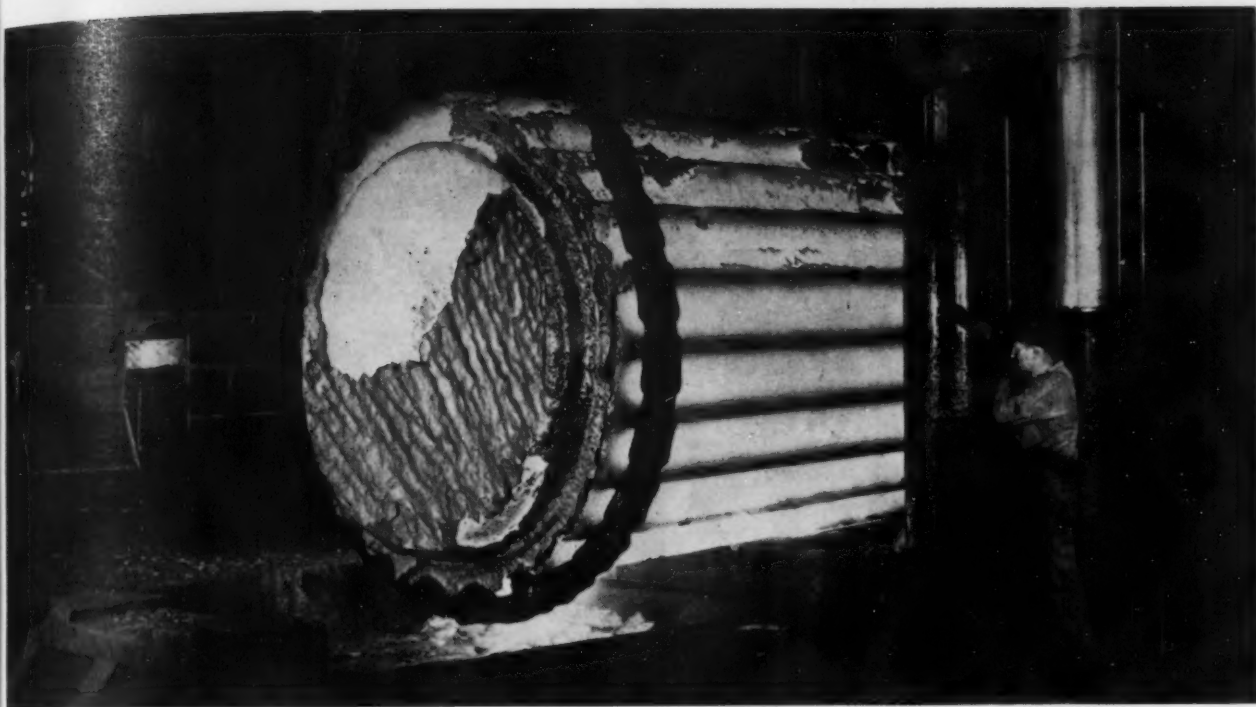
CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS



**HIGH CYCLE**





## GIANT INGOT YIELDS STEEL FOR TIE-ROD FORGING 70 FT LONG



One of the largest steel ingots ever produced was recently cast at Bethlehem and used in the making of a huge forging.

The ingot, pictured here, had a diameter of 11 ft, 2 in.; weighed better than 700,000 lb. Pouring was done through a secondary ladle holding 75 to 80 tons, and the ingot was allowed to cool for 96 hours before being taken from the mold.

This giant yielded the steel for the massive tie-rod forging shown below. The finished piece, an astonishing 70 ft long, will be used

in a 25,000-ton press. At the stage shown in the photograph, the weight of the forging was approximately 320,000 lb.

It is interesting to note, in contrast, that Bethlehem also produces some of the smallest forgings made, a few being so tiny that you can balance them on a fingertip.

BETHLEHEM STEEL COMPANY  
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by  
Bethlehem Pacific Coast Steel Corporation, Export  
Distributor: Bethlehem Steel Export Corporation



June 25, 1953

\* Starred items are digested at the right.

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Address mail to 100 E. 42 St., N. Y. 17, N. Y.

## NEWS DEVELOPMENTS

### HOW TOP ROLLER STARTS UP NEW SHEET MILL—P. 67

No expectant father is more tense than a rolling mill boss when he's running in a new mill. The new mill is Pittsburgh Steel's \$28 million hot sheet mill at Allentown, Pa. Heading up the crew of highly trained specialists is Tony Thomas, a veteran of 18 years on hot sheet mills.

### REPUBLIC SEAMLESS TUBE MILL'S A 'NATURAL'—P. 68

Last week Republic Steel formally opened its new 180,000-ton-per-year seamless tube mill at its South Chicago works. It classed the move as a "natural" and indicated the mill has advantages of strategic location and high demand. Oil country goods consumers continue to exert pressure on producers.

### HOW WORK SIMPLIFICATION SLASHED COSTS—P. 69

Thompson Products, Euclid, Ohio, has worked out a method of streamlining operations without introducing expensive innovations. The method's called work simplification. Thompson has saved an estimated \$2 million over the past 5 years. Over 2000 new methods have been put in practice.

### HOW SHORT RUNS ON SCREW MACHINES PAY—P. 72

Sven Hoagberg's office is in his pocket—not his hat. For in his pocket he carries a sheet of paper listing status and location of short run jobs scattered through the plant of Hartford Machine Screw Co. Sven has been able to consistently show a profit on "unwanted" short run business.

### STEEL INDUSTRY SPENDING MORE ON RESEARCH—P. 77

Sometimes charged with lagging in research, the steel industry is now spending more than it ever has before. But it is still behind chemicals, aircraft, auto and electrical industries. U. S. Steel is planning a new research center near Pittsburgh. List objectives of industry's current research plans.

### ROBOT SPRAY GIVES STUDIES PRIME PRIMER—P. 82

Studebaker paint shop now sprays all exterior priming coats electrostatically. Painting time is cut from 25 to 13 sec per body. Features include uniform thickness, fewer rejects, no paint waste. Electrostatically sprayed color coat may be the next step. Water sanding may be dropped.

# the Week in Metalworking

## ENGINEERING & PRODUCTION

**SINTERED BUSHINGS EXTEND CHAIN LIFE—P. 125**  
Roller chain with sintered steel bushings is more satisfactory than standard chain where proper lubrication cannot be applied. It outlasts standard chain if shock loads are not too great. Sintered bushings resist corrosion, absorb some shock and keep chain elongation within allowable limits longer.

**FAST PRECISION ROLLING FORMS JET SEALS—P. 128**  
Accurately made rolls and ingenious coiling equipment speed forming of precision parts. A standard machine with special tooling forms nickel seals for jet engines at a linear rate of 70 fpm. Diameter of seals is held within 0.005 in. and other major dimensions are within 0.001 in.

**NEW PLATING PROCESS EXTENDS USE OF GOLD—P. 131**  
Smooth, hard gold plate deposited by a new process combines wearability with appeal. Cost, quality and durability now make gold finishes practicable for many industrial and consumer products. Plate is bright and uniform without brushing or buffing. Throwing power of bath is excellent.

**REINFORCEMENT REMOVAL IMPROVES WELD—P. 136**  
Mild steel weldments have less tendency to crack when welds are ground flush than if reinforcement remains in place. Weldments subjected to balanced biaxial loading over a range of temperatures in explosion tests confirm these conclusions. Reinforcement causes rise of 80° F in transition temperature.

**BUTT-BRAZE TIPS TO IMPROVE TOOL LIFE—P. 140**  
In machining helicopter transmissions, cutters with carbide tips brazed to the front faces of shanks gave poor performance. By butt-brazing tips to the top of the shank, tool life was improved more than 200 pct. Shank deflection was decreased and design reduced brazing strains.

**NEXT WEEK—COOL COOLANT FOR PRECISE MACHINING**  
Magnesium workpieces are extremely sensitive to heat generated by cutting action and temperature changes. By cooling the coolant with refrigerating units at each machine, dimensions which formerly ran 0.003 to 0.008 in. oversize are now being controlled to 0.001 in. total tolerance.

## MARKETS & PRICES

**PASS ON STEEL PRICE HIKES RELUCTANTLY—P. 65**  
Manufacturers will not pass higher steel prices on to the consumer as a matter of course. Quite the contrary—it appears that more of the higher costs will be absorbed than will be passed on to the public. Boosts will come reluctantly in the face of increasing competition.

**START FIRST COLLEGE PURCHASING COURSE—P. 71**  
Illinois Institute of Technology offers a 4-year course for prospective purchasing executives. Buyers were polled to see (1) if they want college-trained specialists and (2) what the course should cover. Response was terrific. Result: IIT starts first class in September. Purchasing is now on a college level.

**SOUTHWEST PROVES LUSTY WELDING MARKET—P. 76**  
For the welding industry the Southwest has always been a good market—it now seems to be getting better. One reason: Terrific industrial expansion in the area. Corridor talk at last week's American Welding Society's meeting in Houston indicated a welding expansion for the district.

**JAPAN SEEN AS A MAJOR U. S. TOOL MARKET—P. 93**  
Attempt to revive Japan's industry is expected to make it a major outlet for U. S. machine tools. Much of Japan's production equipment is over-age and must be replaced. Exports from U. S. are increasing and will continue to grow. Germany regarded as chief competition.

**STEEL USERS FACE \$800 MILLION COST HIKE—P. 159**  
Steel users are busy figuring how much steel price increases will cost them. New base price increases raised The Iron Age Finished Steel Composite Price \$4.30 a ton. Recent extra increases averaged an estimated \$5 a ton. At current rate of production annual steel bill would be up over \$800 million.

**ALCOA, UNION START WAGE NEGOTIATIONS—P. 162**  
Labor contracts with Aluminum Co. of America and Reynolds Metals Co. expire on July 31. First official talks started this week between Alcoa and the United Steelworkers. Reynolds is having informal discussions. Workers will ask substantially the same terms as they got from steel industry.



# THE MOST *Economical* WAY TO MELT *Quality Bronze*

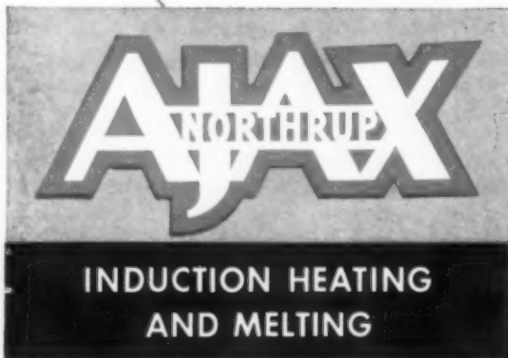
## AJAX-NORTHROP INDUCTION FURNACES

An Ajax-Northrup equipped bronze foundry, melting a wide variety of alloys in lift-coil furnaces, reports 10% higher tensile strength for certain of its induction-melted alloys... and has reduced melting costs by over \$33.00 a ton at the same time!

Similar performance is reported by users of the larger tilting furnaces. The tilting units are slightly more efficient than the lift-coil equipment, and are used where ability to switch alloys frequently is less important.

If you haven't looked into the possibilities of induction melting for your non-ferrous foundry lately, we'd like to show you some of the data we've gathered from recent installations. Just write or phone us.

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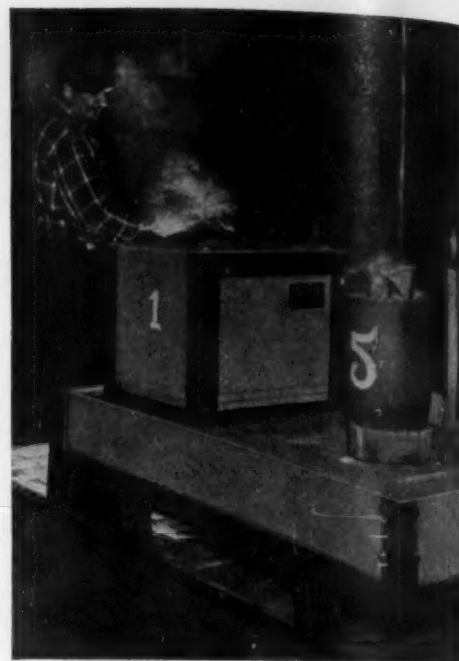
**AJAX ELECTROTHERMIC CORPORATION**  
Ajax Park, Trenton 5, New Jersey

*Associated Companies*

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Since 1916

THE IRON AGE



**LIFT-COIL FURNACES** can melt different alloys simply by switching crucibles.



**TILTING FURNACES** are used for larger quantities, or special production runs.

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# THE IRON AGE

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## Editorial

*The Iron Age*

FOUNDED 1855

## Summer Checkup

THIS is the age of checkups. If it isn't your own doctor it is Mayo, Cleveland, White Sulphur or some other favorite clinic. Main idea is to see how you are standing the strain of today's hectic existence.

While you ponder what the doctor said or may say to you here are a few questions he will not ask you. You can answer to yourself:

¶ When did you last see a sunrise? Or when did you last walk around your yard at 6 a.m. in your bare feet?

¶ Have you taken time recently to watch a mother robin prepare a night crawler for her children's breakfast?

¶ Do you remind yourself that a smile begets a smile? And that people who smile are better workers?

¶ Do you give your kid the money for a double-header? Or do you go with him? Have you caught his knuckle ball lately?

¶ Do you know the awful doubts that assail your daughter as she studies psychology or science? Will you be ready—at the right time—to help restore her faith?

¶ Does a paid service remind you of your anniversary or your wife's birthday? Do you ever take home a present because it was a happy thought at the time?

¶ Would you be embarrassed to tell your friends in a normal conversation that you go to church? Or that you got help from the Bible?

¶ Can you tell a weed from a flower anymore? Or have you tried to find out what a squirrel does with the food he collects?

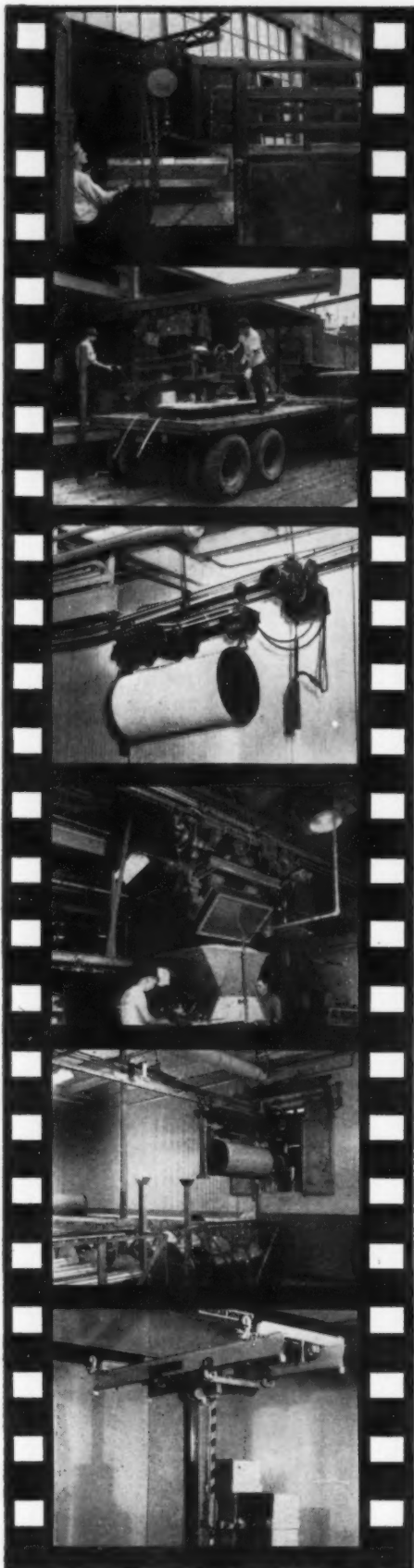
¶ Do you believe there is nothing really new under the sun? Or that a hundred years from now it won't make too much difference what you thought today?

¶ Are you still putting off dropping a note to that teacher who gave you the help, kindled the spark and sent you on your way? When will you drop a letter to that fellow who listened and helped out when no one else cared or had time?

There is no score to this checkup. You are the sole judge of what life means to you. There is always some time left for a fresh slant.

*Tom Campbell*

Editor



Quickly  
removes die  
blocks from  
trucks

Saves \$30  
each truck  
unloaded

Delivers beams  
to another  
building

Automatic  
delivery of  
core sand

Automatic  
transfer of  
slasher beams

Stacker crane  
increases stor-  
age by 60 %



a 16 mm movie that discusses  
handling problems common  
to every industry

Before you decide upon any material handling equipment, let us loan you "Up and Over". This 16 mm film shows many installations of American MonoRail overhead handling equipment. You will see hand operated to fully automatic systems—one or more that may be particularly adaptable to your operations. The film is educational, interesting, informative and shows the way to economical, safe and time-saving material handling. Your ticket of admission is only a note to us asking for a print. It will help us if you advise the exact date, as close as possible, when you wish to use it.



**THE AMERICAN MONORAIL COMPANY**

13103 ATHENS AVENUE

CLEVELAND 7, OHIO



# Dear Editor:

## Letters from readers

### No Time For Jitters

Sir:

We read and greatly appreciated your editorial "No Time For Jitters" which appeared in your June 11 issue. As a matter of fact, we are so much impressed with this we would like to have the privilege of reprinting this in a bulletin which will soon be on the press in connection with our product.

Would you kindly advise us if this is possible.

A. B. TAYLOR  
President

Universal-Standard, Inc.  
Pittsburgh

### Die Lubricant

Sir:

We would like to have more information about the item, on the News-front page of the June 4 issue, stating that die casting producers have reported 50 to 60 zinc die releases with a single treatment of a new release agent.

Would you very kindly send us the name of the manufacturer.

E. M. BROAD  
Metallurgist

Hitchiner Mfg. Co., Inc.  
Milford, N. H.

The manufacturer of the die lubricant is the Dow Corning Corp., 592 Saginaw Road, Midland, Mich.—Ed.

### New Bar Mill

Sir:

We are interested in the location of the Green River Steel Co. which, we understand, was recently established somewhere in Kentucky. Any help you can extend in serving this information will be appreciated.

H. J. SCHMITT  
General Sales Manager  
Laboratory Equipment Corp.  
St. Joseph, Mich.

The Green River Steel Co. is in Owensboro, Ky.—Ed.

### Defines Industrial Terms

Sir:

I have seen your June 4 issue in which you reprint the first part of the Glossary of Terms Used in Methods, Time Study and Wage Incentives recently released by our Society for the Advancement of Management.

As you, of course, indicate by your very action in doing this, the subject matter is of great importance and becoming more so. So much time and money is wasted in industry because of a lack of clarity of terms being used that it is always heartening when someone with the authority which you and your publication bring to the question takes a stand in favor of getting

into such problems at their root—namely, getting the clarification rather than continuing the argument.

H. F. SMIDDY  
Vice-President, Management  
Research & Development Div.

Society for Advancement of Management  
New York

### Organic Coating

Sir:

We are interested in the organic coating which may be a satisfactory replacement for tinplate in the manufacture of containers and closures for food and other products mentioned on p. 51 of the June 11 issue.

Could you let us know more about what type of coating it is and who makes it or where we could get this information.

K. H. BROCKSCHMIDT  
Plastics Engineering Co.  
Sheboygan, Wis.

The organic coating was developed by the Mellon Institute, 4400 Fifth Ave., Pittsburgh, Pa., who will be able to give you more information.—Ed.

### Semiautomatic Scale

Sir:

In your May 7 issue you had an article entitled "Weighing Machine Reduces Manual Handling" which mentioned the Inter-Lakes Engineering Co.

We are very much interested in contacting this company and would appreciate your furnishing us with the address.

I. A. SHEPARD  
Shepard Engineering Co.  
St. Louis

The Inter-Lakes Engineering Co. is located at 4845 Bellevue Ave., Detroit 7, Mich.—Ed.

### Lifting Magnet

Sir:

I would like information concerning the lifting magnet shown at the annual Materials Handling Show. This was described on p. 126 of your May 28 issue.

S. B. DOAK  
Superintendent  
Industrial Engineering Div.  
Aluminum Co. of Canada, Ltd.  
Shawinigan Falls, Quebec

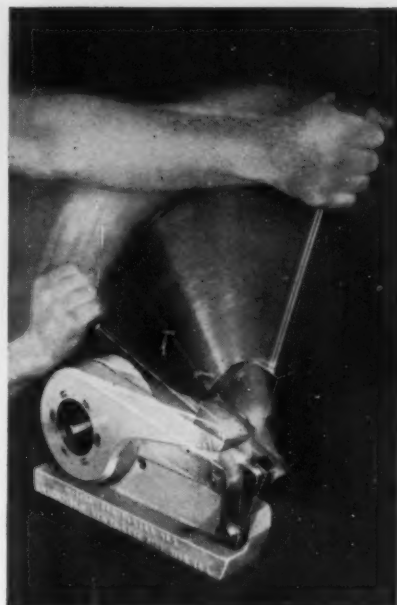
The Harnischfeger Corp., 4460 West National Ave., Milwaukee 14, Wis., will be able to give you further details on the lifting magnet.—Ed.

### Aluminum Welding

Sir:

Kindly send two tear sheets of the article "Three Ways to Boost Aluminum Welding Production" appearing in your June 4 issue.

F. E. CARROLL, JR.  
Chief Engineer  
United Aircraft Products, Inc.  
Dayton



## CUT BAR STOCK up to 5/8" Diameter

Accurately, Instantly with  
a DI-ACRO\* ROD PARTER

The shearing-breaking action of a Di-Acro Rod Parter allows most bar stock to be cut without burr and distortion. After parting, the bar is easily inserted into a hole its same diameter and the end can be threaded or riveted without further processing.

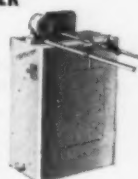
Holes in cutting heads accommodate eleven different round stock sizes. Also special heads for cutting square, and other shaped bars.

### BOTH HAND AND POWER MODELS AVAILABLE

Instantaneous cutting action with Di-Acro Power Rod Parter. Rate of production is limited only by speed with which stock can be fed.

Motor driven flywheel, other moving parts housed in welded, steel cabinet.

\*pronounced Die-ack-ro



Like More Information? . . . Send for  
32-Page Catalog



Gives complete details on hand and power operated Di-Acro Rod Parters, Benders, Brakes, Notchers, Punch Presses, Rollers and Shears.

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*Experienced men  
and modern tools*

**machine Finkl forgings and die blocks  
to your specifications**

In our modern machine shop the experienced eyes and hands of men like Herman, Carl, and Charley see that Finkl forgings and die blocks are machined to your requirements. We have complete control over the quality of the steel, forging and heat treating. These experienced men with modern machine tools complete the cycle thereby giving you the finest forgings and die blocks available.

Since 1879 "Forgings by Finkl" and die blocks for "Impressions that Last" have been quality products at lowest cost to you. When planning die block and forging requirements we invite you to call on our experienced men and modern facilities.



**MANUFACTURERS OF THE LARGEST FORGINGS IN THE MIDDLE WEST**

**A. Finkl & Sons Co.**

**2011 SOUTHPORT AVENUE • CHICAGO 14**

**ELECTRIC FURNACE STEELS • DIE BLOCKS • FORGINGS**

# Fatigue Cracks

by William M. Coffey

## Only One Number One

Every once in awhile something happens to THE IRON AGE that makes everybody around here feel pretty good. Sometimes you just can't help feeling a little proud about whom you work for and what you work for. And it's hard to keep to yourself.

This week at the National Industrial Advertisers Assn., Editor Tom Campbell, for the second straight year, will step forward and receive first prize in Industrial Marketing's Fifteenth Annual Business Paper Editorial Competition. This is the highest award in business publication journalism and it is given for the best series of articles in the industrial division.

In a letter to THE IRON AGE, Industrial Marketing said "... we heartily congratulate you in winning this award in a field of 515 entries of outstanding quality."

Last year we won the same award with our articles on boron steels. This year the articles on titanium scooped the field. This was a series of five articles that started in "Metals for Tomorrow," which itself proved so popular that over 5000 reprints were requested. The titanium series, as a radio announcer would say, was "... a brilliant and penetrating analysis of the perplexities of titanium, assembled by our veteran technical staff." Another job well done by your IRON AGE men in action.

\* \* \*

... and lest you forget here's a reminder of something else you've been getting for your eight dollars. Accurate IRON AGE forecasts and predictions have become commonplace. So much so in fact, that rarely do we stand up and cheer about it. It is simply expected of us. Because this seems to be spring cheering day, however, here's one more proof that we're still on the job.

Weeks in advance of the steel wage settlement—on Apr. 22nd—we predicted in our regular news release, which is widely quoted by newspapers and everyone else, that wages would go up 10¢ an hour and that the price of steel would go up \$4 a ton. What happened? Of course.

Had enough? Stand one more? OK, thanks. Last week's issue, on page 99, carried an article entitled "MEMORY: Executives Shouldn't Forget." It's all about a remarkable school run by Dr. Bruno Furst that teaches businessmen how to remember facts, faces and figures—the arithmetical kind. The final examination requires each student to scan 75 pages of a magazine and then tell accurately what is on each page. What magazine is used? Naturally.

## Puzzlers

The solution to the Bizebal problem: Indians 6, Tigers 5; it was an eleven inning game and was played at Detroit. Winners: A. R. Kerr, J. N. Guilian, H. F. Boswell, J. E. Wren, J. O. Marshall, Raymond Robinson, R. L. Powell, Lt. Eliason, D. W. Sampson, Paul A. Tackett, Rheem Puzzle Club, Mary Lou Perrott, H. B. Johns, Z. B. Kopicki, Wilma Cicero, Suzanne Ogden, Wm. McCord, Bill Farley, 3rd, Harvey Gendron, Jack Howarth and Mr. Rice.

## New Puzzle

A hunter goes out of his house, heads 10 miles south, then 10 miles west and kills a bear. He then goes 10 miles north and winds up home. What is the color of the bear's skin?

\* \* \*

Please renew your subscription.

## English Lesson

For variety's sake here's a poem we think well of. Saw it in the Colorado Fuel & Iron Works' Blast.

### THIS IS MURDER!

We'll begin with box, the plural is boxes,  
But the plural of ox is oxen, not oxes;  
One fowl is a goose, but two are called geese,

Yet the plural of moose is never meese;  
You may find a lone mouse, or a whole nest of mice,

But the plural of house is houses, not hice.  
If the plural of man is always men,  
Why shouldn't the plural of pan be called pen?

If I speak of a foot and you show me two feet,  
And I give you a boot, would a pair be called beet?

If the singular's this and the plural these,  
Should the plural of kiss ever be keese?  
We speak of a brother and also of brethren,  
But though we say mother, we never say methren.

Then the masculine pronouns are he, his and him,  
But imagine the feminine, she, shis and shim

Any questions?

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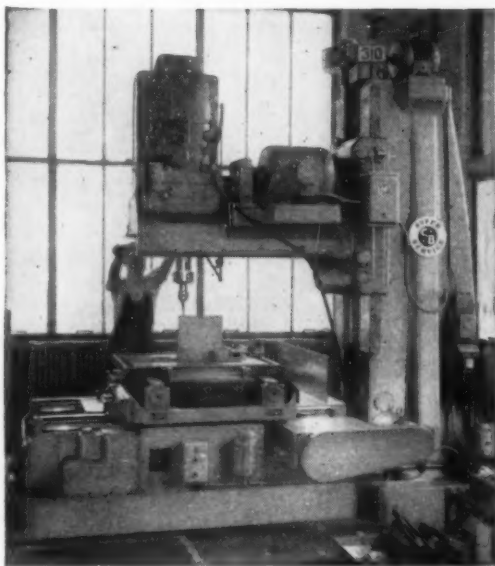
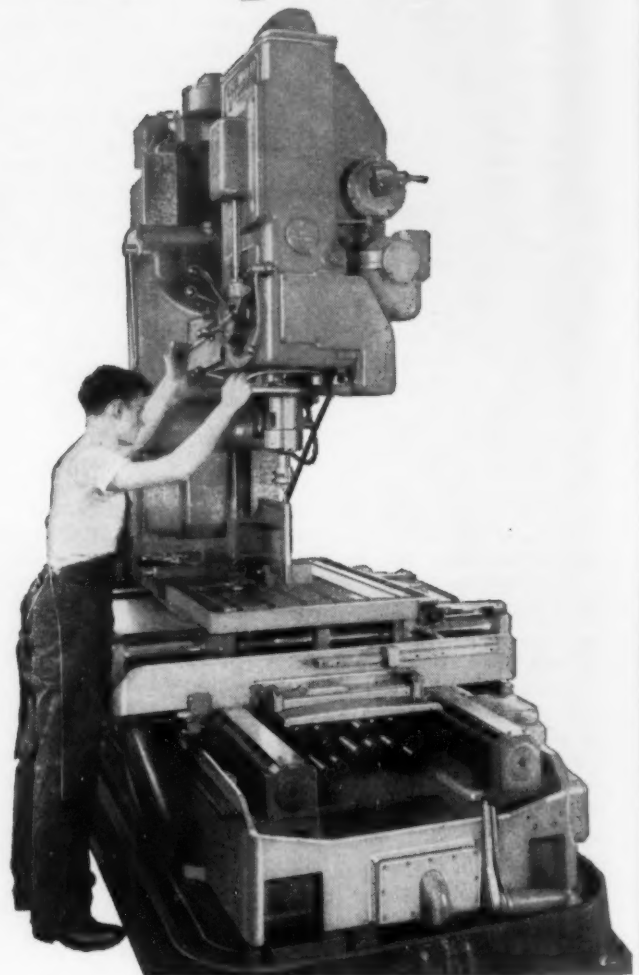
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*Photo courtesy The American Can Company*

Time savings of many hours and sometimes weeks are effected by using the special Cincinnati Bickford fixed arm Precision Drilling Machine—with a Bullard Man-AU-Trol spacing table. Jigs and fixtures are entirely eliminated and accuracy is maintained within limits of .001". Changes from job to job are made at low cost. The results obtained with this installation at the American Can Company are being duplicated in many other plants. This combination may effect startling savings for you.

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## Dates to Remember

### Meetings

#### JUNE

RAILWAY SUPPLY MANUFACTURERS ASSN.—Exhibit, June 22-27, Atlantic City, N. J. Association headquarters are at 60 E. 42nd St., New York.

ALLOY CASTING INSTITUTE—Annual meeting, June 28-30, The Homestead, Hot Springs, Va. Institute headquarters are at 32 Third Ave., Mineola, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Semiannual meeting, June 28-July 2, Statler Hotel, Los Angeles. Society headquarters are at 29 W. 39th St., New York.

#### EXPOSITIONS

NATIONAL METAL SHOW—Oct. 19-23, Cleveland.

AMERICAN SOCIETY FOR TESTING MATERIALS — Annual meeting, June 29-July 3, Chaifonte-Haddon Hall Hotel, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

#### JULY

TRUCK TRAILER MANUFACTURERS ASSN.—Annual summer meeting, July 23-24, Edgewater Beach Hotel, Chicago. Association headquarters are at 1024 National Press Bldg., Washington.

NATIONAL TOOL & DIE MANUFACTURERS ASSN. — Summer meeting, July 30-Aug. 1, Milwaukee. Association headquarters are at 907 Public Square Bldg., Cleveland.

#### AUGUST

WESTERN ELECTRONIC SHOW & CONVENTION—Aug. 19-21, Civic Auditorium, San Francisco. Headquarters are at 1355 Market St., San Francisco.

NATIONAL AUTOMATIC MERCHANDISING ASSN.—Convention & Exhibit, Aug. 23-26, Conrad Hilton Hotel, Chicago. Association headquarters are at 7 S. Dearborn St., Chicago.

#### SEPTEMBER

ELECTROCHEMICAL SOCIETY — Fall meeting, Sept. 13-17, Wrightsville Beach, N. C. Society headquarters are at 235 W. 102nd St., New York.

NATIONAL PETROLEUM ASSN.—Annual meeting, Sept. 16-18, Traymore Hotel, Atlantic City, N. J. Association headquarters are at Munsey Bldg., Washington.

NATIONAL FOUNDRY ASSN.—Annual meeting, Sept. 16-18, Plaza Hotel, New York. Association headquarters are at 53 W. Jackson Blvd., Chicago.

PACKAGING MACHINERY MANUFACTURERS INSTITUTE — Annual meeting, Sept. 20-23, Skytop Lodge, Pa. Institute headquarters are at 342 Madison Ave., New York.



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# HOW THE SLAYSMAN COMPANY REDUCED THREADING TIME BY 97%

The Slaysman Company, a large machine shop and parts sub-contractor in Baltimore, reduced threading time on one contract operation from 2 hours to 4 minutes by the installation of a LANDMACO Threading Machine.

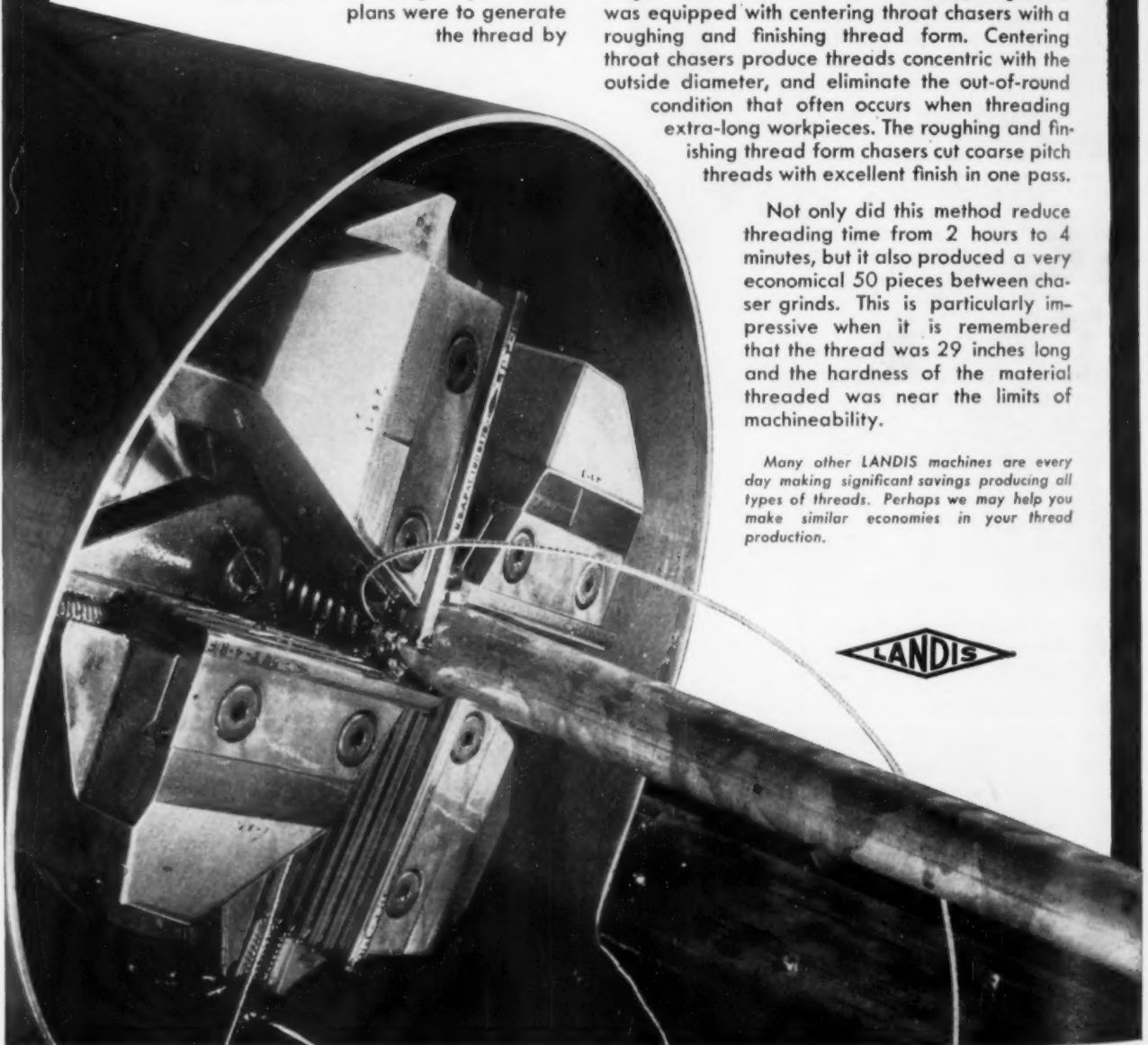
This contract required the cutting of a 1" diameter 5 pitch Acme thread 29" long on C1141 steel to a Class 3 fit. Original production plans were to generate the thread by

milling. At the same time, even though the specifications and the hardness of the material seemed to preclude other methods, we were asked if we could suggest a more efficient threading process.

Based on our recommendation after studying the thread specifications, a 1½" LANDMACO Single Head Leadscrew Machine with an extra-long carriage was installed. The LANDCO threading head was equipped with centering throat chasers with a roughing and finishing thread form. Centering throat chasers produce threads concentric with the outside diameter, and eliminate the out-of-round condition that often occurs when threading extra-long workpieces. The roughing and finishing thread form chasers cut coarse pitch threads with excellent finish in one pass.

Not only did this method reduce threading time from 2 hours to 4 minutes, but it also produced a very economical 50 pieces between chaser grinds. This is particularly impressive when it is remembered that the thread was 29 inches long and the hardness of the material threaded was near the limits of machineability.

Many other LANDIS machines are every day making significant savings producing all types of threads. Perhaps we may help you make similar economies in your thread production.



THE **LANDIS Machine CO.**



**WAYNESBORO  
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## THE IRON AGE Newsfront

**EFFORTS OF STEEL PRODUCERS** to make each product pay its own way is seen in recent price rises. For example rails, a longtime low profit item, were raised \$5 a ton on top of a \$6 per ton raise of 6 weeks ago. Total increase is \$11 a ton.

**COLD ROLLED SHEETS**, on the other hand, a relatively profitable item, were raised only \$4 a ton. And the extra increase of a few weeks ago were only \$1 to \$2 a ton—considerably lower than the average for most products.

**STEEL CONSUMERS** who've been licking their chops over anticipated savings from avoiding conversion costs may find this cushion used up before they realize it. Reason: they'll have to absorb higher mill prices for steel. Auto companies are typical examples. Some have paid conversion costs ranging to \$25 per car.

**FEWER EXCHANGE RESTRICTIONS** and provisions for special tax concessions are planned by Colombia and Peru in an effort to attract private capital of North American investors. Impressed with the success of Brazil and Venezuela, the two countries are laying the groundwork for a broad industrial expansion.

**APPLIANCE MAKERS**, ALREADY EXCITED over the increasing demand for year-round air conditioning, now see the heat pump on the horizon. One major appliance maker already has a division set up; others will probably follow suit. Stress will be on comfort and convenience, but don't be surprised to see a battle of operating costs.

**RECOVERY OF VALUABLE BYPRODUCTS** in waste pickle liquor in the steel industry by chemical treatment is moving slowly because of union problems. Chemical recovery of such waste would bring in the chemical workers' union, a United Mine Workers affiliate.

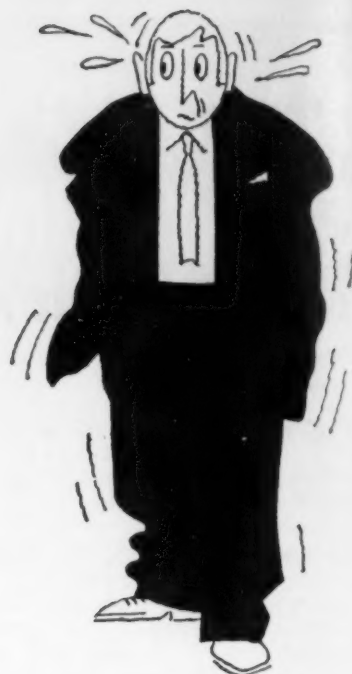
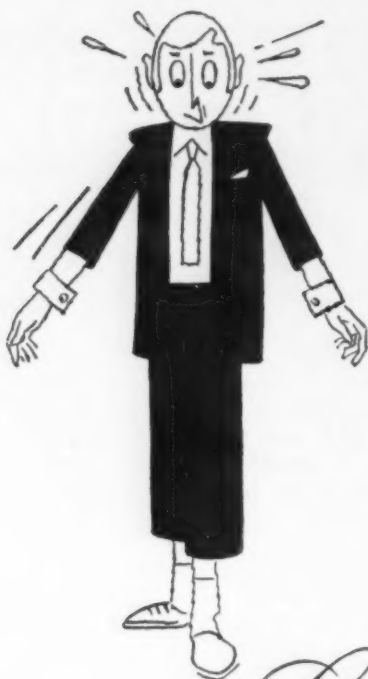
**ONLY ONE OPERATION** is needed to determine carbon and sulfur contents in ferrous alloys using a recently developed procedure. The method uses a high-frequency combustion unit to heat specimens to over 3000°F. Heat is generated in the sample only.

**A MODERN PARADOX** lies in the possibility that plastic forming dies may find an important place in shaping steel automobile bodies while metal dies may be used extensively to form plastic car bodies.

**ZIRCONIUM BORIDE** and a similar family of cermets developed for high temperature structural use have been found to have good possibilities as cutting tool materials.

**USE OF ALUMINUM** deposited on the inner surface of a plastic material is increasing rapidly for automotive and other decorative parts.

**EMPHASIS IN STEEL RESEARCH** is on development of new alloys to conserve critical and strategic materials such as nickel and columbium. Other aims are to combine physical properties of steel with protective coatings against corrosion, and increasing productive efficiency of costly equipment, particularly in iron and steel melting phases.



*Like the right size suit*  
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**THINSTEEL** *is tailored to your need*



Buying steel is very much like buying a suit—you prefer to buy the steel or the suit that EXACTLY fits your requirements. True, any item made to fit a particular need may cost a little more than a product offered for all-purpose usage; but the first cost, particularly the "first steel cost," may be relatively unimportant. The end-product cost is the most important consideration. If cold rolled strip or spring steel is involved in fabrication of component parts for your end-products, and the labor cost for fabricating and assembling those component parts is an important part of your total cost, you'll want to investigate CMP strip products.

CMP strip can be made to fit the most exacting needs, whether it be in terms of close tolerances, uniformity of structure, temper, finish or physical properties. The use of specially prepared CMP strip made to the measure of a particular processing or end-product requirement is contributing to lower total costs for many manufacturers. We'll welcome the opportunity to "try CMP strip for size" in your fabricating or assembly operations. Don't compromise steel quality for first steel cost.



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# STEEL: Pass on Price Hikes Reluctantly

**More of higher steel costs may be absorbed by manufacturer than are passed on to public . . . What individual industries may do . . . New prices are listed—By W. V. Packard.**

Manufacturers will not pass higher steel prices on to the consumer as a matter of course. Quite the contrary—it appears that more of the higher steel costs will be absorbed than will be passed on to the public.

Those who feel they must raise prices of consumer goods are doing so with great reluctance. Competitive forces are stronger than they have been for many months. These are the main conclusions drawn from an IRON AGE survey of steel consumers:

## Will Absorb Higher Prices

Steel's No. 1 customer, the auto industry, will absorb most of its higher steel costs. Major auto companies are depending on economies of high volume production and sales, plus savings from less dependence on expensive conversion and foreign steel, to help offset higher cost of regular mill steel. Procurement of conversion, foreign, and broker steel has been costing some auto companies several dollars a car.

For smaller auto companies it will be tougher to hold the price line. Some may be forced to adjust their prices, but they will do so only as a last resort to keep selling price above costs (see p. 82).

## Narrow Margins Pinch

One large appliance maker indicated it would raise prices on major appliances using large amounts of steel. Another large appliance maker was unsure of its price policy and would delay decision pending further study of its steel costs. Still another hoped it would be able to hold the line but was unwilling to commit itself definitely to that course.

There will be some selective price increases on some machinery and equipment, but across-the-board increases are unlikely.

Farm equipment makers, already having sales trouble, face a dilemma. Profit margins have been kept narrow in a declining market, but they doubt already sluggish sales can support higher prices.

Stampers, though operating at high levels, have been keeping profit margins narrow for competitive reasons. At least some of the higher costs will be absorbed. The same is true for makers of fasteners, who have been depending on volume to keep them in the black.

Higher costs will be passed on by builders and fabricators having escalation clauses in their con-

tracts. Warehouse prices will also reflect mill changes.

Prospects are that already strong competitive pressures will be intensified in the months ahead. This will put the heat on all departments for greater efficiency.

The seventh wage-price round doesn't have the inflationary push of some of its predecessors—even though wages and prices are no longer controlled.

## Meeting Price Rises

Other major steel producers are generally meeting the higher prices posted by U. S. Steel Corp. The price increases average close to \$4 a ton, as had been predicted by THE IRON AGE.

Increases are selective, as indicated by the accompanying table. For some companies increases average less than \$4 a ton; for others the average is more than \$4, depending on products produced.

THE IRON AGE Finished Steel Composite Price increased \$4.30 a ton. It now stands at 4.632¢ per lb, compared to 4.417¢ per lb before the increase. This weighted price index is based on prices of ten of the most common steel products accounting for the major portion of steel shipments.

*Checklist of prices on p. 66*

U. S. Steel announced its new prices last Tuesday (June 16), just 4 days after signing a new wage contract with the United Steelworkers of America. New prices are effective on June 17.

Although steel companies raised extra charges about 6 weeks ago, this is the first general increase in steel base prices since July 24, 1952. At that time an increase of \$5.20 a ton was permitted to partly compensate for a wage increase costing about 25¢ an hr. This was after a 54-day strike. All things considered, the current wage agreement will cost about 10¢ an hr (THE IRON AGE, June 18, p. 91).

## Average Increases Per Ton

Product	Increase per ton
Forging ingots, blooms billets, slabs	\$5.00
Rerolling blooms, billets, slabs	3.00
Skelp	4.00
HR Bars	4.00
CF Bars	5.50
Structural shapes	5.00
Concrete bars	4.00
Plates	4.00
Rails	5.00
CR Sheets	4.00
CR Strip	7.00
HR Sheets	3.00
HR Strip	4.00
Galvanized sheets	4.00
Electrical sheets	10.00
Pipe & Tube	\$5.00 to 9.50
Wire	6.00
Wire Rods	4.00
Alloy steel	4.00 to 6.00
Stainless steel	10.00 to 45.00



## Checklist of Steel Price Increases

Following are new mill prices of U. S. Steel, effective June 17. Prices are in dollars per net ton unless otherwise noted. Extras apply. Former prices are listed for comparison.

	New Price	Old Price	Increase		New Price	Old Price	Increase
<b>CARBON STEEL:</b>				Trenton and Worcester	\$144.50		
Ingots, forging	\$ 59.00	\$ 54.00	\$ 5.00	Nails			
Blooms, billets, slabs—forging	75.50	70.50	5.00	Donora, Duluth, Joliet, Rankin and Fairfield	Col. 131	Col. 127	Col. 4
Blooms, billets, slabs—rerolling	82.00	59.00	3.00	Worcester	Col. 137	Col. 133	Col. 4
Skelp	75.00	71.00	4.00	Polished staples			
Tube rounds	92.50			Donora, Duluth, Joliet, Rankin and Fairfield	Col. 133		
HR bars, small shapes	83.00	79.00	4.00	Worcester	Col. 139		
Cold-finished bars	104.00	98.50	5.50	Wire—merchant quality—Annealed			
Concrete rein. bars	83.00	79.00	4.00	Cleveland	\$133.50	\$127.50	\$6.00
Structural shapes	82.00	77.00	5.00	Donora, Duluth, Joliet, Rankin and Fairfield	133.50	127.50	6.00
CB's (Including CBL, CBJ and CB sections)	82.00			Worcester	139.50	133.50	6.00
Bearing piles	82.00			Wire—barbed			
Sheet piling	98.50	93.50	5.00	Donora, Duluth, Joliet, Rankin and Fairfield	Col. 153	Col. 148	Col. 5
Plates	82.00	79.00	4.00	Woven fence			
Standard rails—No. 1 O.H.	86.50	81.50	5.00	Donora, Duluth, Joliet, Rankin and Fairfield	Col. 140	Col. 133	Col. 7
Standard rails—No. 2 O.H.	84.50	79.50	5.00	Safe ties			
Standard rails—all No. 2 O.H.	85.50	80.50	5.00	Donora, Duluth, Joliet and Fairfield	Col. 149	Col. 143	Col. 6
Light rails	104.00	100.00	4.00	<b>PIPE AND TUBULAR PRODUCTS:</b>			
Tie plates	102.50	98.50	4.00	Butt-weld standard and line pipe, black and galvanized			\$5.00
Joint bars for standard rails	105.50	101.50	4.00	Seamless 2 to 4" standard and line pipe, black and galvanized			5.00
Hot-rolled strip	78.50	74.50	4.00	Seamless 5" and over standard and line pipe, black and galvanized			6.00
HR sheets (18 ga. and heavier)	78.50	75.50	3.00	Oil country casing and tubing, grade J-55			7.00
Cold-rolled sheets	95.50	91.50	4.00	Drill pipe, grade D, internal upset			9.50
Galvanized sheets, regular	105.50	101.50	4.00	Seamless pressure and mechanical tubing—carbon			9.00
<b>HIGH STRENGTH PRODUCTS:</b>				<b>ALLOY STEEL</b>			
<b>USS COR-TEN</b>				Ingots	\$62.00	\$57.00	\$5.00
Structural shapes	123.50	116.00	7.50	Billets, blooms, slabs	82.00	76.00	6.00
CB sections	122.50			HR bars	97.50	93.50	4.00
Plates	125.00	119.00	6.00	Cold-drawn bars	126.50	121.00	5.50
HR bars, small shapes	124.50	118.50	6.00	Plates	111.00	105.00	6.00
Hot-rolled sheets	118.00	113.50	4.50	Structurals, bar shapes	100.00		
Cold-rolled sheets	144.50	138.50	6.00	Strip	128.00		
<b>USS MAN-TEN</b>				<b>STAINLESS STEEL</b>			
Structural shapes	101.00	96.00	5.00	Type 304	(cents per lb)	(cents per lb)	(dollars per ton)
CB sections	102.00			Ingots, rerolling	18.25	17.50	15.00
Plates	103.00	99.00	4.00	Slabs, billets, reroll.	23.75	22.75	20.00
HR bars, small shapes	99.00	95.00	4.00	Billets, forging	31.00	29.75	25.00
Hot-rolled sheets	95.50	92.50	3.00	Bars, wire, structurals	37.25	35.50	35.00
<b>USS ABRASION RESISTING:</b>				Plates	39.75	38.00	35.00
Plates	105.00			Sheets	48.75	46.50	45.00
HR bars, small shapes	106.00			HR strip	34.25	32.75	30.00
Hot-rolled sheets	101.50			CR strip	43.75	41.75	40.00
<b>WIRE PRODUCTS:</b>				Type 430			
Wire rods, carbon				Ingots, rerolling	14.25	13.75	10.00
Donora, Cleveland, Joliet and Fairfield	90.50	86.50	4.00	Slabs, billets, reroll.	18.50	17.75	15.00
Worcester	96.50	92.50	4.00	Billets, forging	24.50	23.50	20.00
Cold-rolled carbon strip				Bars, wire, structurals	29.75	28.00	25.00
Cleveland	109.00	102.00	7.00	Plates	30.50	29.25	25.00
New Haven	119.00	112.00	7.00	Sheets	43.50	41.50	40.00
Wire—Mfrs. bright, low carbon				HR strip	27.00	25.75	25.00
Cleveland, Donora, Joliet, Duluth, Rankin, Waukegan and Fairfield	110.50	104.50	6.00	CR strip	34.75	33.25	30.00
Worcester	115.50	110.50	6.00	<b>OTHER ITEMS</b>			
Premier spring wire—high carbon				Electrical sheets			\$10.00
Cleveland, Donora, Duluth and Waukegan	132.50			Long ternes	\$113.50	\$109.50	5.00
New Haven, Trenton and Worcester	138.50			Enameling sheets	103.50	98.50	5.00
MB spring wire—high carbon							
Cleveland, Donora, Duluth and Waukegan	138.50						

## STEEL:

Don't bother the roller... His life is no picnic when new sheet mill comes in.

No expectant father is more tense than a rolling mill boss when he's running in a new mill. Top man on a team of enormously skilled specialists, the boss roller only has to allow one mistake to seriously damage a multi-million dollar baby.

Heading the team that recently proved in Pittsburgh Steel Corp.'s new \$28-million hot sheet mill at Allenport, Pa., was Roller Anthony (Tony) Thomas.

A veteran of 18 years' experience on hot sheet mills, Tony was keyed to peak performance by the challenge of an entirely new mill. Staking his reputation as a roller on this job, he worked long hours with his crew, technicians and shirt-sleeved top management to bring in the largest installation of its type built in the Pittsburgh district in 15 years.

Now 38, Tony started his career with Jones & Laughlin Steel Corp. in Pittsburgh in 1930. Five years later he was on his way to Lackawanna, N. Y., to help bring in a new hot mill for Bethlehem Steel Corp.

He returned to J&L a year later, became assistant roller at the hot sheet mill in 1942—rolling thousands of tons of steel for defense during World War II, and later for peacetime production.

When he came to Pittsburgh Steel last year, he brought with him all of this vast knowhow in rolling steel. And he knew how to put his special skill to work, leading his rolling crew with the driving force of a Joe Magarac, legendary hero of the steel industry.

Pictures show Tony Thomas in action, rolling first steel on test runs on the new hot sheet mill at Allenport.

## All In A Day's Work For A Roller



"I can't guess. Check it with calipers."

"Let this roll down easy"

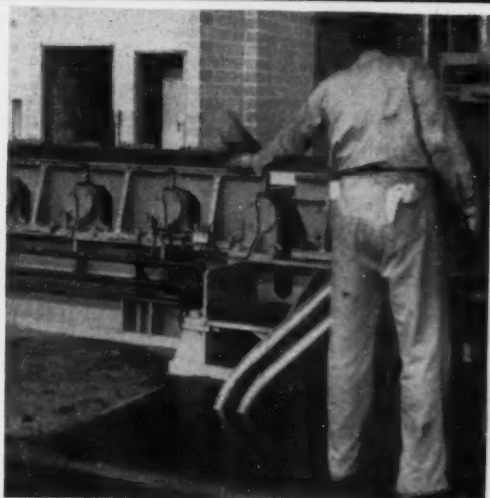
"It's got to be right on the nose"



"Get it off that guide"

"One more dumb trick like that and I'll . . ."

"Let 'er roll . . . Full speed ahead"



"I'll finish it myself"

"I'll tip my hat to the first sheet off any time"

"Good job, Tony" . . . "Thanks, Milt"

## TUBING: Republic Mill's a 'Natural'

**New 180,000-ton-per-year seamless tube mill opens at Republic Steel's South Chicago works . . . Has advantages of location, demand . . . Climax to expansion program.**

Classing the move as a "natural," Republic Steel Corp. last week formally opened its new 180,000-ton-per-year seamless tube mill.

The company is counting on advantages of location and demand to keep the mill humming for a long time. Its South Chicago location gives it access to both water and rail shipment.

In Republic's own words: "The mill is located close to the industrial heart of the country, within economical shipping distance to most potential customers." Giving the tube mill a happy send-off is current demand for its products. Oil producers are and will remain eager takers as they put pressure on increasing output.

Although Republic officials did not elaborate, they indicated that a precision mechanical tube mill is scheduled for the same site.

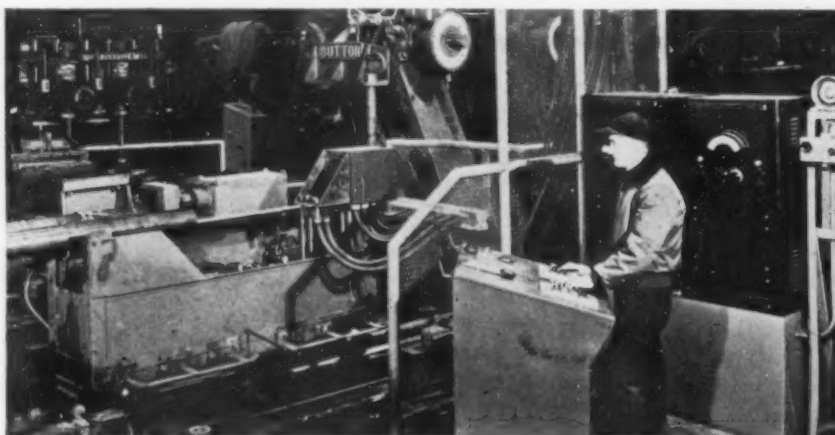
New seamless tube mill facilities consist of a 70-ft diam automatic rotary hearth furnace, automatic loaders, two piercer stations and a plug mill. Auxiliary furnaces complete the lineup. With primary output slated mainly for oil country use in the Southwest,

the mill will make seamless tubes in alloy and carbon—in sizes ranging from 2 $\frac{3}{8}$  in. O.D. to 9 $\frac{5}{8}$  in. O.D.

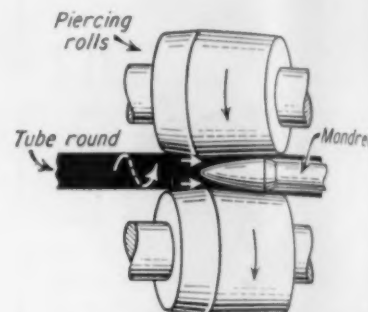
Completion of the tubing mill climaxes South Chicago plant expansion which also included a hike in steelmaking capacity.



RED HOT STEEL billet has just been pierced in early operation. Republic's seamless mill will convert it into tubing.



X-RAY THICKNESS GAGE tests seamless tubing at new Republic mill. Device consists of a traveling carriage on which an x-ray probe is mounted. As the carriage advances, the probe enters the end of the revolving tube. A spray gun on the outside of the tube parallels the advance of the probe. Should a thin wall be detected, the spray gun paints a yellow band on the tube and faulty section's cut away.



TUBE ROUND reaches forging temperature in rotary hearth furnace. Roller conveyor takes it to centering machine for positioning. Rolls of No. 1 piercer stand grip round while piercer point on mandrel bar holds steady. As shown above, the round is literally forced around piercer point to form tubing. No. 2 piercer stand further reduces wall size. Plug rolling mill puts on finishing touches in reducing wall thickness. Reelers polish tubing. Sizing mill gets it to accurate size.

### Copper, Cobalt from Rhodesia

Increased production of copper and cobalt from northern Rhodesia is expected to result from a new Export-Import Bank loan of \$22,400,000 to a power company in that country.

This amount is about two-thirds of the total cost estimated for an expansion program by Rhodesia Congo Border Power Corp. Ltd., wholly-owned by four mining companies operating in the copper belt.

Under the agreement, the U. S. is to be allowed to buy copper and cobalt at going prices in the amount sufficient to pay off the loan, term of which runs for 5 years.

### Ferroalloys in Magnesium Plant

Pacific Northwest Alloys, Inc., has leased from the government a major portion of the magnesium plant at Spokane which had been one of five marked for closing down.

General Services Administration said Pacific Northwest would make ferroalloys in the plant, under conditions which would allow reconversion to magnesium production in short order if required.

Lease arrangement is for 10 years with options to renew for two additional 5-year periods. Pacific Northwest is a subsidiary of Chromium Mining & Smelting Corp. of Chicago.



# COSTS: Cut \$2 Million In 5 Years

Thompson Products has full-fledged program . . . Depends on plenty of education and conscious efforts in all departments . . . Use employees' suggestions—By R. M. Lorz.

Nothing interests manufacturers more than cutting costs. They can't afford not to wade through all the advice they get in the hope that some of it will help them win the competitive race to the wire.

Thompson Products, Inc., Euclid, Ohio, has worked out a pretty good method of streamlining operations without introducing expensive innovations. Thompson is making a capital investment of common sense.

Without installing different machinery or cutting down on personnel the firm has saved an estimated \$2 million over the past 5 years.

## Make Them Conscious

Dollar magic at Thompson's sprawling TAPCO plant isn't sleight of hand. They call it "work simplification." As explained by industrial engineer Don Fouse those two words describe a process of organizing common sense to find an easier way to do the job.

Mr. Fouse has been selling the plan to TAPCO people since 1948 when he launched a series of conferences designed to get everyone in the plant thinking of methods improvements.

Since the program got underway over 500 supervisors have sat in on simplification lectures and demonstrations. Returns have been uniformly good because success is measured by practical applications. So far over 2000 new methods have been put into practice.

Although results are more than impressive work simplification at TAPCO is built around only five elementary steps which include: (1) Singling out bottlenecks which are hard on production and tempers; (2) devising a flow process chart which graphically shows what men and machines are doing; (3) analyzing the facts; (4) suggesting methods for improvements; and (5) putting them into effect.

The program isn't limited to particulars because it isn't organized that way. A more general plan for attacking methods is built into the system through organization.

## Whole Plant Organized

In addition to the Plant Methods and Planning Department each separate division at TAPCO also has a methods and planning group. These men continually sell the program within the plant. They also analyze and process suggested improvements which come up from the floor.

Here's how it works: A foreman who has devised a better way of doing a certain job in his department doesn't just mention it casually to his immediate superior and forget about it. Instead he gets the idea down on paper and copies are sent to the plant operating staff. If the suggestion has utility for general application it is sent to methods engineers in each division in the

shop. In this way the easy way becomes reality. New methods are also given a thorough testing for validity in a communications cross-fire which insures ample consideration for every man's idea.

Those primarily concerned with the success of work simplification at Thompson say the motion picture has been invaluable as an agent for illustrating results. One staffer has become an expert cameraman by continually going through the plant taking "before and after" shots. The object of course is to send supervisors away with the question, "Why didn't I think of that?"

## Wrong Methods Show

Critics who give simplification a quick look are likely to say, "It all sounds great but how do you come up with an idea?" At this point proponents really wax eloquent. They reason that it is a great deal easier for the man on the job to come up with improvements than it is for a rank outsider. All it takes is conscious effort and a few standard tools.

In simpler terms supervisors have to put their operating techniques on the witness stand. Can it be done with less reaching and lifting? Can rearrangement of the work place save steps? Are tools located properly? Are they the right tools? Are unguarded hazards slowing workers up? Are materials within easy reach?

Cumbersome and costly methods usually stand out like sore thumbs when supervisors start thinking in this vein. The results in terms of dollars and cents indicate a ratio of \$10 saved for every \$1 spent.

Intangible savings also result from reduction of safety hazards and worker fatigue. It would also be difficult to estimate the extent of improvements in reduced floor space and variable material savings at TAPCO.

Although Don Fouse is considered the father of work simplification at the Ohio plant, he says the credit should go to the supervisors who have translated words into action. "It takes a lot of different talents to effect cost-saving method improvements," he says.



STEEL PANELS are examined as they emerge from a multi-stage spray washing machine in Wyandotte Chemicals, research lab.

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## Trade

### Tariffs:

**RTA extension seems sure...  
Commission to study trade.**

Whether American tariffs stay low, sink lower, or rise protectively high depends on recommendations of a 17-man commission which will study our trade policies and their effects on the economy.

In extending the Reciprocal Trade Agreements Act for another year, Congress will attach two riders which create the investigating body and appoint a seventh member to the Tariff Commission.

#### Explore Trade Policies

Last week the House approved extension of RTA and this week the Senate Finance Committee was rushing it to the floor where no serious opposition was expected. The riders had made it palatable to most legislators.

The special commission will explore our foreign trade policies and recommend methods to foster high levels of trade without endangering national security or the economy. This is such a terribly complicated task, and is so dependent on personal interpretation that impartial answers are difficult to reach. Of the 17 members, five will be Senators, five will be Representatives, and seven will presumably be chosen by the White House from industry.

#### Gain Political Control

Democrats who opposed adding a seventh man to the Tariff Commission said that the extra vote to break a tie was superfluous since the commission had not had a tie in its history. They say a fourth Republican on the commission gives political control to one party.

But since Republicans are divided on the tariff question, it seems that the personal convictions of the man to be picked are more important than his politics. In any event, under RTA the President has the power to reject any Tariff Commission recommendations.

## BUYING: Higher Education for PAs

Illinois Institute of Technology offers full course for prospective purchasing men . . . Buyers polled for ideas . . . Arouses nationwide interest—By K. W. Bennett.

The first 4-year college course for purchasing executives will be inaugurated by Illinois Institute of Technology at Chicago this fall. The 4-year course is a unique combination of industrial and educational planning: a course for purchasing men designed by purchasing men.

The possibility of producing campus-trained specialists in purchasing is not new. But it received its first real impetus last year, when 1100 members of the Purchasing Agents Assn. of Chicago (a National Assn. of Purchasing Agents affiliate) were polled as to: (1) Whether they wanted to hire college trained specialists, (2) what they thought a college trained purchasing man should know.

### Want College Men

The 1100 purchasers responded handsomely to three preliminary questions. (1) Did they commonly recruit their purchasing trainees from sources outside their own organization? (2) Did they want college graduates? (3) What should the basic course be?

The majority wanted a man with a Bachelor of Science degree in business and economics. When the replies to the first two were affirmative, the Chicago association made its findings available to the Illinois Institute of Technology. A detailed questionnaire was then mailed and the purchasing agents chose a curriculum.

### Interest Is Nationwide

Initial classes, both evening and day, will begin in September on the Chicago campus of the Institute. The first year's classes are not expected to be large, anywhere from 15 to 30 students, who will thus have the advantage of seminar-type training.

While inquiries have come in even at this early date from points as distant as Houston, Tex., and New York City, the Illinois Insti-

tute will offer only on-campus courses, will not conduct any type of correspondence training.

Headed by Illinois Institute's business and economics head, Dr. Pearce Davis, and under the sponsorship of the Purchasing Agents Assn. of Chicago, the course has aroused interest among purchasing agents nationally.

### Set Up Curriculum

Here's what 1100 Chicago purchasing agents want in a college trained purchasing trainee:

**Purchasing**, purchasing principles, buying for specific industries, purchasing problems, research and analysis in purchasing.

**Accounting**, principles of accounting, cost accounting, budgeting.

**Business Law**, business law, contracts, business law and the market.



BEARDED at his desk, Carl Raines, General Electric turbine installation engineer is sporting whiskers grown on a 3-month stay in India's Bihar Province, site of India's largest thermal power plant, now under construction there.

**Marketing & Sales**, marketing, industrial marketing, sales management.

**Human Relations**, industrial relations.

**Statistics**, economic statistics.

**Money & Banking, Business Cycles**, money, banking and prices.

**Management Policy**, theory of organization and management, engineering economics.

**Industrial Processes**, retailing, manufacturing processes, production control, blueprint reading.

Along with the courses above will be included general education courses in economics, history, mathematics, English and psychology.

### "Little Has Been Done"

Besides handling the survey, the Chicago purchasing agents set up two 4-year scholarships, to be awarded this year on a competitive basis. Purchasing agents are generally enthusiastic, and there are indications that the movement will expand into other areas of the U. S. Said one who had worked with the survey, "It puts purchasing where it belongs, as a profession."

Said the Illinois Institute of Technology, "Until recently, comparatively little has been done by educational institutions in the development of specialized programs for the training of purchasing executives. Today, purchasing is generally acknowledged to be a well-defined management field, of critical importance to the efficient operation of practically all public and private industrial organizations."

### Metal Retailers on Their Own

Hardware dealers, farm supply stores, and other retail outlets will henceforth have to rely on their own efforts to stay stocked up on nails, wire, and other hard goods made of steel, copper and aluminum.

National Production Authority last week revoked M-89, effective as of June 30. Issued in late 1951, its purpose was to help retailers maintain reasonable stocks of varied essential items by issuing self-certification authority.





SAVING TIME and money begins with streamlined order processing. Short run manager Sven Hoagberg puts simple drawing and all instructions on one sheet of paper.

## SCREW MACHINES: Short Runs Pay

**Short run department operates profitably as plant within a plant . . . Success requires wide product range, many versatile machines . . . Special expediting helps—By W. V. Packard.**

Sven Hoagberg's office is in his pocket—you see he doesn't wear a hat on the job.

Sven is manager of the "short run" department of Hartford Machine Screw Co. And he's been

able to consistently show a profit on "unwanted business" since his department was created about 2 years ago.

### Makes Profit on 10 Pieces

Most machine screw people will tell you that undertaking short runs in a "volume" plant is a losing proposition. If undertaken at all, they are usually special favors to valued customers.

It used to be that way at Hartford. Not so today. Sven profitably handles orders for as few as ten pieces.

Actually Sven's office is in his pocket only in the sense that he carries there a complete record of exact status and location of many short run jobs scattered throughout the plant. All this is on a single sheet of paper. He's almost constantly on the move, doesn't spend much time in his air conditioned headquarters.

### Speeds Job Greatly

In addition to conducting a brisk and profitable short run business, Sven and his three lieutenants advise and assist the company's regular operation when short runs are needed to fill in on a volume job.

These highly skilled and experi-

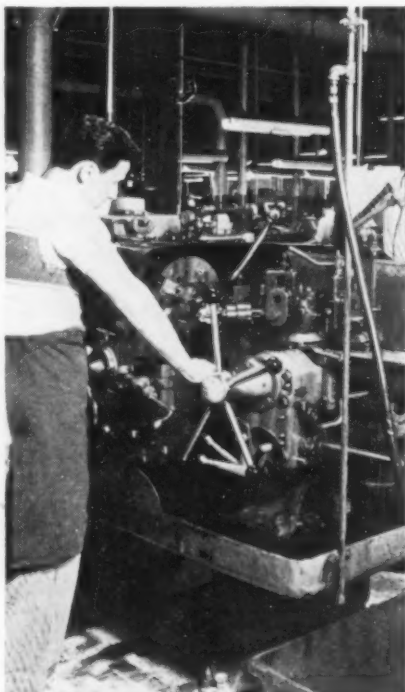
enced men are expeditors in the real sense. For example, on a certain rush military order, production department estimated delivery within 2 months. Short run department managed to get the job out in 2 weeks.

The short run department operates like a small business within a fairly large one. In producing a job it buys materials, machine time, and labor from other departments. Careful cost accounting provides an accurate profit picture for even the smallest job.

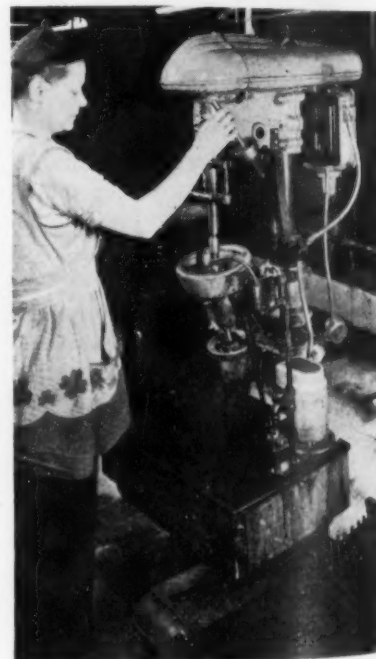
### Needs Versatile Equipment

Though short cuts are used to keep paper work to a minimum, actual production setups are standard. Management is one key to success of the department. But no matter how prudent the management, it is doubtful that the short run department could operate successfully without benefit of broad product range and large number and variety of machines.

To give you an idea—Hartford Machine Screw is located in an ultra modern 273,000 sq ft plant. It employs about 850 (mostly skilled) workers who operate some



SHORT RUN jobs usually begin on hand operated screw machines. This avoids longer setup time on big automatics.



TINY PISTONS for refrigeration units in jets require mighty close tolerance. Job stayed in short run because it gets close attention.

1100 machines. Plant is tooled up to make some 3000 different parts. Its precision screw machine products are used by a wide range of industry—watchmakers, locomotive builders, textile manufacturers, aircraft producers.

### Saving Starts Early

Saving time and money begins when an order is first received by the short run department. In the regular production department, new orders go through extensive processing that consumes many hours, or even days. Processing includes engineering drawings, production planning, and sometimes tool design. It culminates in a master "box card" and numerous sheets of supplementary directions that stay with the order all the way through the plant.

Short run department says "to heck with all this." Sven or one of his assistants makes a simple sketch and puts all instructions on a single sheet of paper. Often this takes only a few minutes. Extremely close supervision assures the order is run off quickly and efficiently.

### Close Supervision Helps

Part of the secret of short run success is that all control is in the hands of one man and his three expeditors.

Short run production usually begins on a Warner & Swasey No. 2 or 3 screw machine. These hand operated machines are preferred because setup time is shorter than on the high production automatics.

Every effort is made to fit short run jobs between regular production runs. This requires a high degree of cooperation, which is furthered by Sven's sense of diplomacy. Regular production runs have been interrupted (rarely) for special emergency short runs, although this is admittedly undesirable and costly. Such a decision may depend on whether or not the customer wants to pay for the emergency interruption.

Short run tactics of close personal attention and special expediting are sometimes applied when

the production department meets a crisis.

An interesting case involved production of tiny pistons for refrigeration units in jet aircraft engines. Pistons must be finished to a tolerance of five hundred-thousandths (0.00005) in., with surface smoothness of 1 to 3 microinches. Short run took this job 2 years ago to do the engineering work and iron out production wrinkles. The job has never left short run department. Management feels the job needs the close attention it is getting.

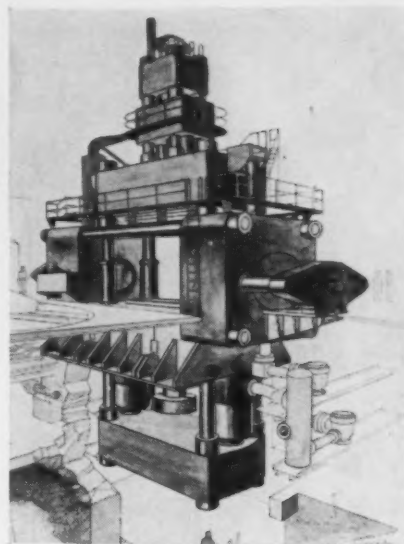
### Sought as Sales Aid

Sales department was really instrumental in starting the short run department—they asked for it as a sales aid. Company officials are satisfied it is a very valuable aid in getting new business.

It works like this: Short run accepts order for production of first experimental parts, and Hartford's name is entered in the customer's purchasing records. Later, if the experimental part is adopted, the customer checks his purchase order. Assured that Hartford people know how to make what he wants, he usually gives them the big order.



FINAL INSPECTION finds few rejects in short run jobs. Careful supervision keeps scrap losses below average for the plant.



ARTIST'S DRAWING of the multiple-ram forging press installed at Cameron Works.

## Forging:

### Big split-die press starts up in Cameron Iron Works.

The country's largest split-die forging press to make oil country and Ordnance forgings up to 6000 lb went into operation last week in Houston's Cameron Iron Works. Built by Baldwin-Lima-Hamilton Corp., the 11,000-ton press puts Cameron in the front rank of the nation's major forge shops.

Most forgings from the new press will be in the 3000 to 6000 lb range. Cameron now handles 1800-lb forgings. Another 4000-ton press is being installed.

Some vital statistics: The big forging press weighs 3,100,000 lb, is 60 ft high. Dies will move in at an approach speed of 600 in. per minute, forging will be done at 200 in. per minute. The two main rams can exert a total force of 11,000 tons, side rams will deliver 6000 tons each, and the top piercing ram will exert 3000 tons pressure. The main rams have a 60-in. stroke, with 144 in. of daylight.

The first test item run was an oil country high pressure valve part in stainless steel. Ordnance will have some call on the press for breech rings, but its primary market will be oil country goods or other forgings to withstand high temperature and high pressures.




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## CRANES

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## Financial

### EXECUTIVES: Plan for Eco

**Businessmen at AMA meeting told to prepare for change . . . Labor goals outlined.**

To find out how to gear their companies to future economic changes, around 600 business executives listened to management, government, and labor spokesmen at the American Management Assn.'s general management conference in New York, June 17-19.

Outlining labor's current objectives, Elmer Walker, general vice-president, International Assn. of Machinists, told the convention that labor will press for higher wages as long as productivity continues to increase.

#### Seek 35-Hr Week

He said output per manhour will probably grow at a rate of 3 pct per year, and that annual wage increases of about 2½ pct per year would be labor's minimum goal.

Mr. Walker indicated there would be a drive for a 35-hr week in all industries. Unions will also try to eliminate wage inequities between skilled and production workers as the wage ratio between skilled mechanics and unskilled workers has dropped from 205 pct in 1907 to 150 pct. He said his union believes wage increases should be on a percentage basis rather than across-the-board.

The IAM executive told the management group his union is not planning to push for a guaranteed annual wage at present but that it is interested in promoting federal rather than privately negotiated pension plans.

#### Let Workers Go Now

Paul Crocker, treasurer, Pepperell Mfg. Co., told the convention the primary responsibility of business is to take counter action to booms and depressions so that government intervention will not be necessary.

He suggested that management inventory its personnel and let go of any unneeded employees while other job opportunities exist. "Don't discover them when you are trying to cut expenses in a depression."



## Economic Changes

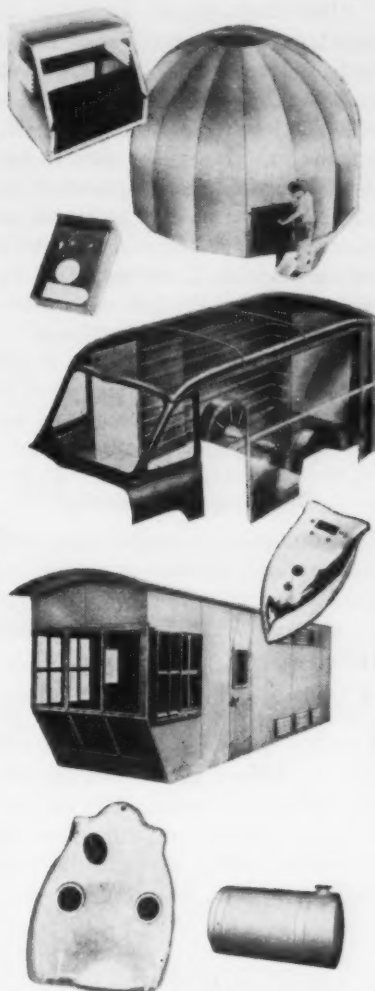
He warned business executives not to wait "for that final reduction in price from your supplier; that may be the one that puts him into bankruptcy and he won't be your supplier again. . . . The sooner another industry gets back on its feet, the sooner it may buy your products in turn."

### Make Progress Checks

Dow Chemical Co.'s Dr. Lewis Lloyd stressed the importance of letting all employees in on the details of company planning. He said research by the University of Michigan shows that better solutions to problems are obtained, department morale is improved, and production is increased when workers are given the facts on problems affecting them and have a part in making decisions.

C. W. Walton, general manager, Adhesives & Coatings Div., Minnesota Mining & Mfg. Co., told AMA members that consumers reward manufacturers most for introducing of new products. Because of this, progressive companies are now planning to use 50 pct or more of their research budgets to develop new processes or products, he said.

To insure company growth under changing economic conditions, Curtis Gager, vice-president and director, General Foods Corp., suggested that management prepare maximum and minimum forecasts as a guide to growth policy. As actual operating figures are reported, management can decide whether the optimistic or the pessimistic forecast is closer to reality and plan accordingly.



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## WELDING: Southwest a Lusty Market

**Demand for fabricating steel in Southwest continues high and industries expand . . . Points to good market for welding equipment . . . How sales are going—By K. W. Bennett.**

For the welding industry the Southwest has always been a good market which seems to be getting better. With Southwest demand for steel remaining strong and its industries enlarging, suppliers of welding equipment view the area as suitable to strike more arcs, light more welding torches.

In blistering Texas heat 1500 welding men streamed to Houston's Shamrock Hotel last week to attend the American Welding Society's technical meeting and exposition.

### Sales Signs Seem Right

Talking market shop between sessions, they noted that Southwest producers and distributors of fabricating steel remained under high demand despite recent expansions of warehouse facilities. Thriving liquified petroleum gas, pipeline, and chemical industries seemed capable of sustaining an enlarging welding market.

Because the signs seemed right several welding materials firms told IRON AGE of plans to expand Southwest sales forces.

Welding men spoke of a drop in sales of heavy equipment and supplies in the past 2 months. The decline was not attributed to any general lowering of the national production rate but to industry becoming increasingly cautious.

### Light Stuff Picks Up

The only major industrial cutbacks noted were in the farm equipment industry. Railroad sales continue at good levels and the new titanium industry is becoming a surprisingly good market for electric welding equipment. Single sales of 50 heavy rectifiers have been reported. The units are believed to be used in the ingot making process.

Sales of lighter welding materials seem to be picking up—particularly

in the Northwest and middle South.

Attracting almost as much interest as the pretty Texas models scattered among the exhibits were such items as a rotating welding unit for joining aluminum pipeline lengths, which may be used in construction of at least one all-aluminum pipeline; a twin electrode arrangement for submerged arc welding; a portable X-ray unit that can be moved onto the job with a two-man crew; a surface roughness indicator about the size of a double cigar box that utilizes the principle of the phonograph needle to mechanically detect rough spots.

### Welding Made Easier

Automatic tracers working with flamecutters showed progress. Of the number of pattern tracing types on the market, one uses a plastic cutout that can be made with a sewing scissors.

Progress in titanium welding and brazing was considerable, according to technical session reports. Regarded as almost impossible a year ago, some titanium jobs can be welded today without the tanks and shelters holding a protective

atmosphere that were previously indispensable. Relatively deep welds have been made without undue brittleness using only a torch having a hood to hold an inert gas like helium.

A helium atmosphere must be similarly maintained over the reverse or root side of the weld. It may be comparatively simple to pump gas into a closed box or tank for welding. But to weld the outside of a complex part, hooding the entire welding workpiece is still necessary.

### Study Humidity on Weld

Low alloys in beta stabilizing titanium alloys are proving to have superior bend ductility while alloys above 3 to 6 pct iron, manganese, chromium, and molybdenum are brittle even after heat treatment. The sole exception was a 13 pct chromium alloy, which proved to have excellent bend ductility even in the as-welded condition. It has been found that bend ductility and notch toughness follow much the same curve, getting poorer as the percentage of alloying material increases.

Although atmosphere shields for welding a titanium work piece are being simplified, it was noted that as little as 1 pct oxygen or nitrogen in the atmosphere will reduce a weld's ductility. Further studies are planned to determine the effect of humidity around the weld and one welding engineer pointed out it is quite possible for titanium to pick up oxygen from water vapor in the protective atmosphere.

### Silver Most Popular

Brazing of titanium has already reached a point where resistance heated lap joints brazed with silver wire were so strong that, under test, the titanium was torn apart while the joint held.

Silver wire appears to be most popular choice for brazing of titanium. Aluminum is ranked second best while copper was reported the poorest brazing material since it corrodes the titanium. Development of fluxes for titanium brazing is past the experimental stage.



"I don't know whether to go in or not. Miss Peach was complaining it was an awfully hot day to work."

# STEEL: Spends More Research Dollars

Sometimes charged with lagging in research, steel is doing something about it . . . U. S. Steel plans new center . . . Objectives of steel research today—By J. B. Delaney.

The steel industry is sometimes charged with dragging its feet on research. It's easy to find arguments either way. In relation to sales, the industry spends considerably less for research than chemicals, aircraft, auto, electrical.

Collectively, steel producers probably are spending more research dollars today than ever. Chances are this will increase. Individually, some companies are not carrying their share of the load.

In a report on industrial research covering 1952, the National Industrial Conference Board lists five unidentified steel companies in terms of the percent of sales dollar spent on research. Expenditures ranged from "negligible" to 0.44 pct.

Nevertheless, steel producers are talking and doing more about research today—perhaps more than they get credit for. New research centers are being built, others are in the planning stage.

It's impossible to say exactly how much money the industry is investing in research. A lot of it is being spent in the plants to improve production processes. Laboratories are coming in for an increasing share. Fellowships in universities and outside labs are increasing. Producers also share cost of research sponsored by American Iron & Steel Institute.

U. S. Steel Corp. is planning a new research center that probably will be located at Monroeville, Pa., near Pittsburgh. Construction will begin as soon as legal technicalities are cleared up. Allegheny Ludlum Steel Corp. dedicated a new lab at Brackenridge, Pa., last November.

Emphasis is still on applied research, but the industry realizes it must pay more attention to fundamentals. Responsibility for this type of investigation has shifted from Europe to the U. S.

Steel research today has these four general objectives:

(1) To develop steels with less of the critical and scarce alloying elements, such as nickel, columbium, and tungsten. Examples are NE steels developed during the war, boron steels, and chrome-manganese stainless steel as a substitute for 18-8 stainless.

(2) To develop improved protective coatings to slow corrosion. Research is being conducted with resins as well as metallic coats.

(3) To improve productive efficiency of costly mill equipment. Research teams are looking for better ways to prepare blast furnace bur-

dens, openhearth and electric furnace charges, coke oven techniques. Rolling mills also are receiving attention.

(4) To overcome brittleness at low temperatures. Some nickel steels are standing up well at low temperatures.

The U. S. Steel research center will consist of three buildings with a combined floor space of 132,000 sq ft. There will be a main laboratory building, an experimental engineering shop, and an industrial process development building.

U. S. Steel plans to consolidate work now being done in four locations outside of plants, and several now inside of plants. Present plans do not contemplate absorbing work now carried on at Kearney, N. J. Provision has been made for future expansion if necessary. Lab staff now consists of 340 persons, including 170 scientists and technologists.

## International

### Schuman Plan:

U. S. may make loans to European Coal, Steel Community

Moral support for the European Coal and Steel Community, as urged last week by President Eisen-

hower, may be backed up by loans from an agency of the U. S. Government, though there is no decision on which one it may be.

In recommendations to Congress, the President said he thought the U. S. should take over part of the financing of the six-nation West European program in order to "foster European integration in a tangible and useful way."

He wrote to Sen. Alexander Wiley, R., Wis., chairman of the Senate Foreign Relations committee, and Rep. Robert B. Chipfield, R., Ill., chairman of the House Foreign Affairs committee, urging an expression of official interest in the program. He noted that the Community does not want grants to boost production but is collecting taxes as security for "substantial borrowing."

The President suggested that the U. S. might provide financial help "out of moneys available for such purposes and under conditions insuring proper use and ultimate repayment."

Both of the legislators contacted saluted the sound basis which the Community has established for its operations.



BIG AIRCRAFT engine air scoop ring is easily lifted by pretty model at Basic Materials for Industry Exposition, held in New York last week. Ring's made of magnesium by Howard Foundry Co., Chicago.



## Heavy Presses Still Important

Reduction of the number of heavy presses ordered by the U. S. Air Force still leaves the importance of this equipment undiminished in the eyes of the flying service and plane builders, according to Air Force Secretary Harold E. Talbott.

Last week Mr. Talbott announced that the 2-year-old press program, set up to provide 17 forging and extrusion presses for about \$389 million, now calls for a total of 10 presses—4 forging and 6 extrusion.

The Air Force chief said this action stems from a belief that the number of presses ordered is in excess of requirements and that use of this equipment "involves some technical and developmental problems which will take time to work out."

He did not explain his reference to "problems," though it has been pointed out that the finishing of die sets for use with the presses is a very difficult job.

Mr. Talbott's announcement indicates a change in high-level military planning. In March, the Defense Dept. said the heavy press program had "been reviewed and the program will proceed as it is now constituted."

### What's Left of the Heavy Press Program

#### SIZE BUILDER USER LOCATION

##### FORGING PRESSES REMAINING IN THE PROGRAM:

50,000 tons	Loewy	Wyman-Gordon	Worcester
35,000 tons	Loewy	Wyman-Gordon	Worcester
50,000 tons	Mesta	Alcoa	Cleveland
35,000 tons	United	Alcoa	Cleveland

##### EXTRUSION PRESSES STILL IN THE PROGRAM:

8,000 tons	Loewy	Harvey Machine	Torrance, Calif.
8,000 tons	Loewy	Reynolds	Phoenix
8,000 tons	Loewy	Kaiser Aluminum	Halethorpe, Md.
12,000 tons	Loewy	Curtiss-Wright	Buffalo
12,000 tons	Lombard Corp.	Reynolds	Phoenix
13,200 tons	Schloemann Eng.	Alcoa	Lafayette

##### FORGING PRESSES CANCELLED:

35,000 tons	E. W. Bliss	Kaiser Aluminum	Newark, Ohio
25,000 tons	E. W. Bliss	Kaiser Aluminum	Newark, Ohio
35,000 tons	United	Harvey Machine	Torrance, Calif.
25,000 tons	Baldwin-Lima-Hamilton	Harvey Machine	Torrance, Calif.

##### EXTRUSION PRESSES CANCELLED:

20,000 tons	Loewy	Alcoa	Lafayette, Ind.
20,000 tons	United	Harvey Machine	Torrance, Calif.
8,000 tons	Loewy	Kaiser Aluminum	Halethorpe, Md.

### Trim Scarce Items List

Extensive revision of the scarce materials list has trimmed down the number of items on List A to six—chromium, cobalt, columbium-tantalum, molybdenum, nickel, and grinding wheels.

These materials are still subject to the inventory provisions of NPA orders M-80 and M-102.

Most iron and steel items, including pig iron, rough forgings, non-nickel bearing stainless, and scrap have been moved to List B.

### Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Bowl, electric coffee maker, 13564 ea, \$61,059, Cory Corp., Chicago.  
 Padlock sets, 3196 set, \$54,643, Charles Kurzon, Inc., New York.  
 Spare parts for pump, 400 ea, \$55,192, Pacific Marine Supply Co., Seattle.  
 Muffler, exhaust, 100 ea, \$67,489, Madison Muffler Co., Long Island City, N. Y.  
 Parts for 57 MM rifle, 27400, \$93,324, West Engineering Co., Richmond, Va.  
 Grinder, cylindrical, 13 ea, \$163,700, The Lang Co., Salt Lake City.  
 Lathe, turret, 2 ea, \$60,291, Gisholt Machine Co., Madison, Wis.  
 Indicator, 1329, \$961,032, General Motors Corp., Plymouth, Mich.  
 Inverter, 712 ea, \$419,121, Jack & Heintz, Inc., Cleveland.  
 Turbosuperchargers, 865 ea, \$3,863,955, General Electric Co., Schenectady, W. H. Bobear.  
 Generators, 357 ea, \$351,571, Jack & Heintz, Inc., Cleveland.  
 Turbosupercharger regulator systems, 506 ea, \$512,560, General Electric Co., Schenectady, W. H. Bobear.  
 Wheel assy, 1000 ea, \$1,732,399, Good-year Tire & Rubber Co., Akron.  
 Circuit breaks, 2278, \$161,738, Northeastern Engr. Inc., Manchester, N. H.  
 Steel cartridge cases, 400000, \$3,672,000, Robertshaw-Fulton Controls Co., Knoxville, Tenn.  
 Cartridge cases, 350000, \$1,908,704, Ekco Products Co., Chicago.  
 Electric motors & repair parts, 23110, \$55,561, Cutler-Hammer, Inc., Milwaukee.  
 Repair parts for pumps, 16753, \$196,833, Worthington Corp., Harrison, N. J.  
 Renovation of booster bodies, 49040, \$1,863,520, Northwest Automatic Products Corp., Minneapolis.  
 Delay housing for fuze grenade, hand, 20000, \$104,000, Frank J. Curran Co., Downers Grove, Ill.  
 Shell, HE, 155 MM, 184900 ea, \$3,629,587, Pullman Standard Car Mfg. Co., Chicago.  
 Fuze, PB, M48A3, 3570450, \$5,790,450, Rulon Co., Chicago.  
 Spare parts, 100 var, \$72,064, International Harvester Co., Chicago.  
 Clip, cartridge caliber .30M1, 13266237, \$449,725, Borg-Warner Corp., Bellwood, Ill.  
 Crane, truck, mounted, 4 ea, \$90,185, American Steel Dredge Co., Inc., Ft. Wayne, Ind.  
 Spare parts, var, \$63,807, Chicago Pneumatic Tool Co., Chicago.  
 Spare parts, var, \$83,772, Mall Tool Co., Chicago.  
 Fuze, grenade, hand, 1500000 ea, \$567,765, Bayshore Industries, Inc., Elkton, Md.  
 Galvanometer, blasting, 10780 ea, \$123,677, Gray Instrument Co., Philadelphia.  
 Shell, 356000 ea, \$432,500, Lehigh Foundries, Inc., Easton, Pa.  
 Flashlights, tubular, 37040 ea, \$94,452, Stewart R. Browne Mfg. Co., Inc., New York.  
 Fans, electric, 3000 ea, \$58,350, Le John Mfg. Co., Washington.  
 Press, hyd. deep drawing, 1 ea, \$61,600, Cincinnati Milling & Grinding Mach., Inc., Cincinnati.  
 Dragline-shovel machine, 2 ea, \$102,570, G. W. Van Keppel Co., Kansas City, Mo.  
 Fuze, 315000 ea, \$277,200, Regina Corp., Rahway, N. J.  
 Parts for gun, machine, caliber .50M2, 42000 ea, \$363,300, American Cystoscope Makers, Inc., Bronx, N. Y.  
 Replenishment of artillery parts, 40, \$111,748, U. S. Steel Corp., Detroit.  
 Replenishment of hardware, 68000, \$59,976, Detroit Aluminum & Brass, Detroit.  
 Replenishment of tank & combat vehicle parts, 1620, \$74,617, Wohler Corp., Lansing, Mich.  
 Replenishment of motor vehicle parts, 19, \$233,289, Fitzjohn Coach Co., Muskegon, Mich.  
 Mechanism, recoil, 105 MM howitzer, 1483 ea, \$3,688,299, ACP-Brill Motors Co., Berkeley, Calif.  
 Mechanism, recoil, M6A2 for 155 MM howitzer, 1223 ea, \$6,108,087, American Locomotive Co., Schenectady.

# YOU CAN'T BEAT GARRETT

**GARRETT STAMPINGS  
SPEED  
PLANT OUTPUT**

**QUICK DELIVERIES  
ON PRECISION  
PARTS**

## STAMPINGS

Save time, trouble and expense by making Garrett your subcontractor on small and medium metal stampings. Garrett has the "know-how" to meet your most rigid specifications. Three modern plants, automatic high-speed presses up to 150-ton capacity, and up-to-date tool shop provide highest quality of workmanship. Finishing equipment includes tumbling, polishing, sand blasting, heat treating and plating.

To speed production, reduce costs, improve quality, make Garrett your headquarters for metal stampings.

### OTHER PRODUCTS MANUFACTURED BY GARRETT

#### SPRING LOCKWASHERS



Greater holding power,  
with controlled tension  
for tighter assemblies.  
Wide choice, plated to  
your needs. Delivery  
from stock.

#### FLAT WASHERS



Most complete line of  
washers in the world. To  
all civilian and Armed  
Forces specifications.

#### HOSE CLAMPS



AIRCRAFT AN737 Stain-  
less steel radial type  
MULTI-CLAMP (QS100  
& AN748) worm type  
screw hose clamp  
AUTO-SEAL the inex-  
pensive high quality  
hose clamp



GEORGE K. GARRETT COMPANY, INC.

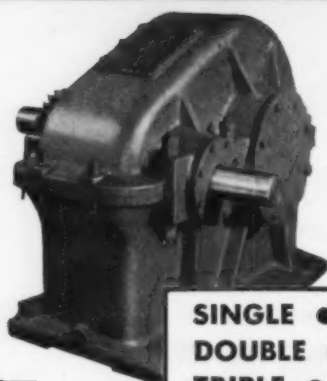
PHILA. 34, PA.

June 25, 1953

Continuous  
Tooth



## HERRINGBONE GEAR SPEED REDUCER



**SINGLE •  
DOUBLE •  
TRIPLE •  
REDUCTION**

**The  
GEAR  
with the Backbone •**

**Some Proven On-the-Job Advantages  
of This Type of Gear Reduction Are:**

- 1** No side thrusts, avoidable deflections, distortions, impact stresses.
- 2** Stronger teeth, due to archlike construction.
- 3** Greater load carrying capacity.
- 4** More silent and smoother gear action.
- 5** Uniform load across face due to balanced thrusts of opposing helices.
- 6** Better lubrication, due to wedge action of teeth.
- 7** Overall design makes it less costly to produce.
- 8** Can be substituted for straight tooth gears.

**We have extensive facilities for making Herringbone Gears, producing them from 1" to 60" in diameter, 16 DP to 1½ DP and up to a 20" face. YOUR GEAR INQUIRIES WILL RECEIVE PROMPT ATTENTION FROM US.**



**SEND FOR  
CATALOG 40-C**

**D.O. James**  
ESTABLISHED 1888

**D. O. JAMES GEAR MANUFACTURING CO.  
1140 W. Monroe Street, Chicago 7, Ill.**

## Industrial Briefs

**Plays Host . . . LUKENS STEEL CO.** was host to a large gathering of friends and press in New York last week. In addition to product exhibits, a top feature of the informal program was a new color movie showing manufacture and use of Lukens' clad steels.

**New Battery . . . KOPPERS CO., INC.,** Pittsburgh, has been awarded a contract by Jones & Laughlin Steel Corp. to design and build a new battery of 79 chemical-recovery coke ovens at its Hazelwood Plant, Pittsburgh.

**Re-Establishing . . . GUNNISON HOMES, INC.,** subsidiary of U. S. Steel Corp., is cooperating in re-establishing the tornado-wrecked Winthrop Oaks community, in Holden, Mass., suburb of Worcester.

**New Prexy . . . Charles J. Nowlan,** supervisor, incentives and production standards, Inland Steel Co., was elected president of the INDUSTRIAL MANAGEMENT SOCIETY.

**On The Way . . . FEDERAL ELECTRIC PRODUCTS CO.** started the first shipment of new motor controls for the Panama Canal on its 6000-mile trip to the Isthmus last week from its Newark manufacturing plant.

**Approval Given . . . OLAN INDUSTRIES, INC.,** Ramset Div., reports its newest fastening tool, the Ramset Jobmaster, has been approved by the New York State Dept. of Labor for use throughout the entire state.

**Going Up . . . GENERAL MOTORS CORP.** is erecting a new building for GMC Truck & Coach Div. wholesale zone at 4715 Colorado Blvd., Denver.

**New Moniker . . . INGALLS STEEL CONSTRUCTION CO.** is the new name of Steel Construction Co., Birmingham, a subsidiary of Ingalls Iron Works.

**Will Build . . . Contracting Div., DRAVO CORP.,** Pittsburgh, will build the substructure of a new four-lane, 800-ft long bridge over the back channel of the Ohio River, near Pittsburgh, for the Allegheny County Board of Commissioners.

**Factory Branch . . . GENERAL ELECTRIC CO.** will open a factory branch early in July in Birmingham for promotion of sales of its newly developed heat pump.

**Sales Office . . . ATLAS CHAIN & MFG. CO.,** Philadelphia, has opened a new sales office and warehouse at 3130 Third Ave., South, Birmingham.

**Formed . . . THE BRISTOL BRASS CORP.** has formed a wholly-owned subsidiary company, The Bristol Brass Corp. of California at 1217 E. Sixth St., Los Angeles. John H. Smith was named vice-president and general manager.

**Appointed . . . MINNESOTA MINING & MFG. CO.,** St. Paul, has appointed Metals Finishing Corp., 584 East Tenmile Rd., Hazel Park, Michigan, as a distributor for Honite barrel finishing products.

**Special Course . . . LINCOLN ELECTRIC CO.** will hold a special 1-week welding course at its Cleveland plant for farm and industrial arts shop teachers from Aug. 24 to Aug. 28.

**Order In . . . LOEWY-HYDRO-PRESS, INC.,** has received an order for three of the largest hydraulic stretching and detwisting machines from 750 to 1500 tons capacity for aluminum extrusions.

**New Structure . . . Construction** in Richmond, Calif., of a new \$100,000 building to house the Western Div. of TRACERLAB INC. is underway.

**Congratulations . . . PETCO ENGINEERING, INC.** of Los Angeles will celebrate its 13th Anniversary next month. Henry Paraneli, general manager, launched the company in 1940.

**Change Made . . . TRANTER MFG. INC.,** is the new name of The Kold-Hold Mfg. Co., Lansing, Mich., effective immediately.

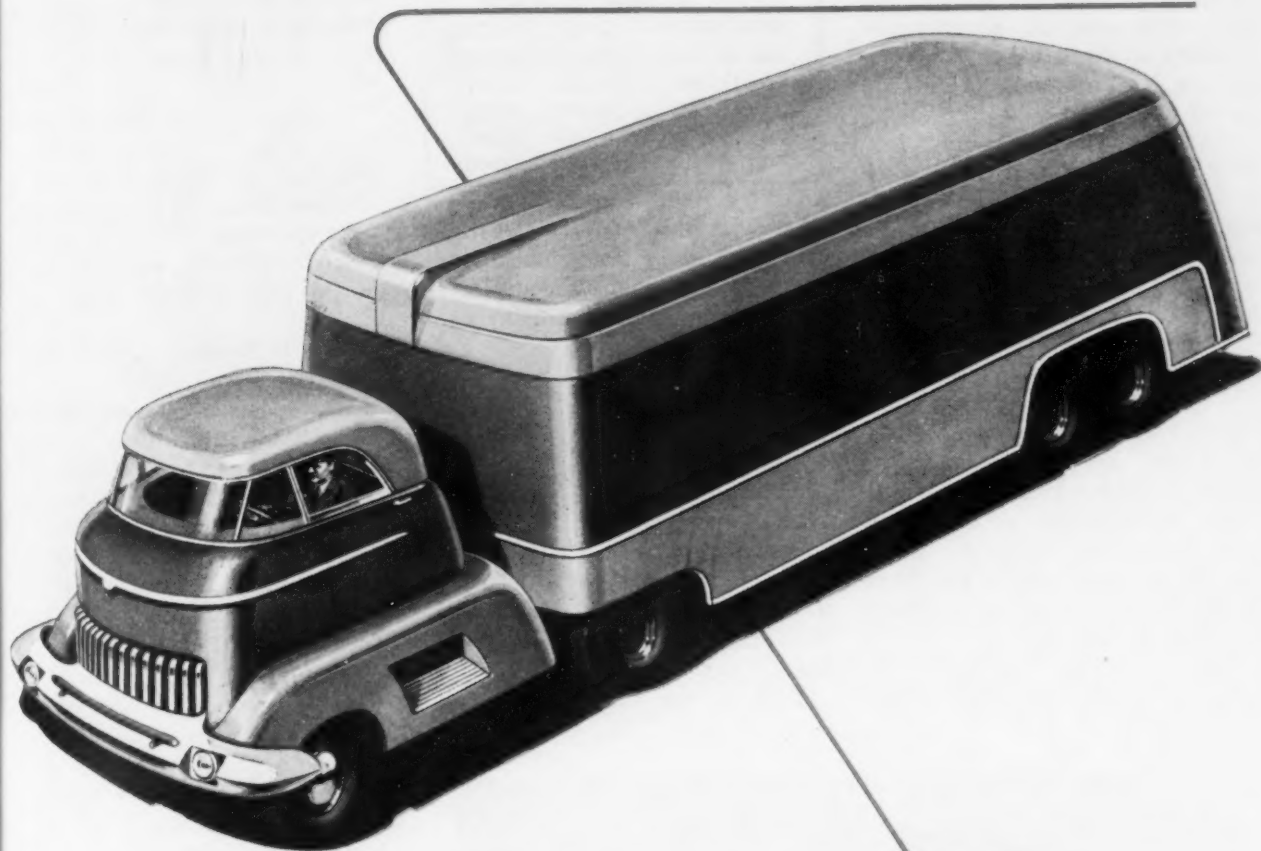
**Record Sum . . . RYAN AERONAUTICAL CO.,** San Diego, Calif., reports a net profit of \$792,833 for the 6 months ended Apr. 30, a record sum for a 6-month period and compares it with the all-time high of \$878,359 net income for the entire 1952 fiscal year.



Specify



**for Lighter Weight,  
Longer Life and  
Operating Economy**



N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures, and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Savings in vehicle weight, with no loss in structural strength, increase the payload ratio and give greater operating economy when you make it a point to specify N-A-X HIGH-TENSILE steel for your highway equipment.

KEEP YOUR SCRAP MOVING TO YOUR DEALER

MAKE A TON OF SHEET STEEL  
GO FARTHER  
Specify



...And  
"MAKE YOUR PRODUCT  
LAST LONGER"

**GREAT LAKES STEEL CORPORATION**

N-A-X Alloy Division

Ecorse, Detroit 29, Michigan

**NATIONAL STEEL CORPORATION**



June 25, 1953

# The Automotive Assembly Line

## Robot Spray Gives Prime Primer

**Stude sprays all outer body primer coats electrostatically . . . Cuts paint time to 13 sec per body . . . No thickness changes . . . Cuts paint loss—By R. D. Raddant.**

An autoworker armed with his paint spray gun is a traditional figure in automobile plants. But successful use of electrostatic painting at Studebaker Corp. indicates he may be a vanishing American.

All exterior body priming is now done automatically at Studebaker in electrostatic spray booths. Present operations are confined to the prime coat but research now going on at this progressive independent indicates that applying the color coat electrostatically may be the next step.

**Saves Time . . .** A total of 36 spray guns, set up in batteries of 9 in 4 locations, can apply prime coats automatically at a rate of 107 Studebaker bodies an hour. Actual painting time is cut from 25 sec for hand painting to 13 sec for the new method.

The Ransburg electrostatic booth is not entirely new in in-

### Automotive Production

(U. S. and Canada Combined)

WEEK ENDING CARS TRUCKS

June 20, 1953 . . . 150,306\* 20,005\*

June 13, 1953 . . . 146,408 20,424

June 21, 1952 . . . 101,422 27,931

June 14, 1952 . . . 102,452 28,658

\*Estimated Source: Ward's Reports

dustry. It has been used successfully in appliance manufacture and elsewhere, but the Studebaker application is the first in the auto industry.

**Doesn't Tire . . .** Big advantages are uniform thickness, fewer rejects, a completely automatic operation, and possible savings in related operations.

In hand application, primer coat thickness varies from 0.0009 in. to 0.0030. in. In the electrostatic method, thickness is a steady 0.0023 in.

And, as one supervisor put it,

this method doesn't get tired at the end of the day. Places difficult for man to reach now get equal treatment.

**No Waste . . .** Paint consumption is about the same in the electrostatic method as in the hand method, but all the paint reaches the car. None of it is wasted. Maintenance is about the same for an electrostatic booth as for any other.

In the automatic operation, each body trips a trigger as it approaches the battery of guns. If the line stops, the paint guns stop. Jobs operating the booths are considered desirable, are now sought out by high seniority men.

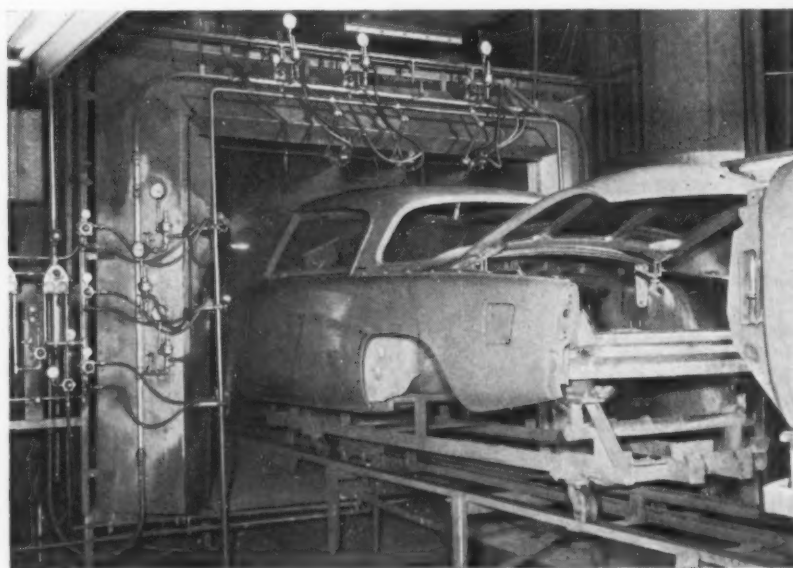
**How It Works . . .** Finish is so good from the electrostatic job that Studebaker engineers are considering cutting down or even eliminating water sanding, the operation which smooths the prime coat finish before application of color. This is still in the experimental stage, but results indicate it may be a possibility in the near future.

In a simple explanation of the process, an electric grid charged with 90,000 volts is at the top of the booth. It generates an electrostatic field into which the paint is lobbed at extremely low atomizing and fluid pressures. The body, being grounded, attracts the paint to its surface.

Considerable trial and error was necessary before Studebaker technicians found the best spots for locating the spray guns. Eddying air currents caused additional trouble and much work on booth construction to eliminate drafts and currents. These have now been licked with the good results listed above.

**Stude Not Sad . . .** At South Bend, incidentally, gloomy talk about auto sales is completely absent.

Studebaker, with its radical styl-



STUDEBAKER BODY trips lever at entrance to electrostatic spray booth, setting off a spray of paint into the electrostatic field about the grounded car.

ing changes this year, may well have the hottest car on the market in its sporty hardtop.

The company was slow to get started this year because of die troubles and showed a first quarter loss in spite of general approval of the new car. Now, at the peak of the sales season, a strike at Borg-Warner has slowed production to a walk.

**Shiftless Models Only . . .** On May 25 the company was forced to a single shift at South Bend and early in June slowed California and Canada assembly operations. Because of the strike, only cars with automatic transmissions are now being assembled.

Going back to the hardtop, Studebaker has revised its percentage of production up to a normal 60 pct. Under present conditions, hardtop production is even higher.

Studebaker is now confident of operating two full shifts and overtime throughout the remainder of the model year. Sales people are also confident of retaining first place among the independents, although this means a late year rush.

"All we need is 2000 transmissions a day," one spokesman says.

**Prices Stay Steady . . .** Auto prices showed every indication of remaining at their present levels following steel price increases.

Chrysler Corp., for example, lowered its prices more than \$100 earlier this model season, but did so with the full realization that the steel price jump was likely. The company has no intention now of taking any of the reduction back.

General Motors and Ford are committed to no-price-change philosophies. Independents, many of them having hard going, are a little in doubt. Some might have to raise prices to show a profit, but will do so with extreme reluctance.

The auto industry is now in close quarters, competitively speaking, and any price increases would be sure to be felt at the salesroom.

It is always difficult to predict what a steel price change means

in automotive production costs. The 1½-ton average steel weight per car is not much of a yardstick when it is realized that costs mean different things to different suppliers.

Cumulative effect actually results in cost increases several times what it would be if figured on steel content. Recent increase on extras actually raised steel cost almost 3 pct to an automaker.

## Accessories:

**Ford has new power steering. Lincoln air conditioning.**

When engineers forecast a rapidly expanding field in power steering at the summer meeting of the Society of Automotive Engineers, (IRON AGE, June 18, 1953, p. 97) they knew what they were talking about.

Only a week later Ford jumped into the field with a new "Master-Guide" linkage booster type power steering, now available for V-8's. Another automaker, a General Motors division, is also expected to

offer power steering within a few days.

The Master-Guide has a hydraulic, double-acting power cylinder built into the conventional steering linkage. A 3½-lb pull is required before power steering takes over at cruising speed.

The unit consists of four main components: Hydraulic fluid reservoir, hydraulic pump, control valve and double-acting power cylinder mounted on the conventional steering linkage and connected by flexible hoses. Price is \$125, lowest in the field at the moment. But general price cuts for power steering equipment have been forecast throughout the industry.

Also in the appliance field, a new air conditioning system for Lincoln Cosmopolitan and Capri cars was introduced last week.

Lincoln's unit is a mechanical system using the principle of recirculation. The system is compact and takes up a minimum of space. A heavy duty radiator and a 5-bladed fan are the only changes in the car required to accommodate the system. Price is \$575.

## THE BULL OF THE WOODS

By J. R. Williams





# the one source

for "Desegatized"  
high speed tool steels

LATROBE... the one source that furnishes "DESEGATIZED" high speed tool steels - uniform in quality - free of carbide segregation - whether you buy on mill order or from warehouse stocks... the mill where Ultrasonic Reflectoscope inspection is a part of standard manufacturing procedure to assure the internal soundness of the tool steel you buy... the only producer to offer disc inspection service to all tool steel users as your guarantee of the top quality you get on every order.

The fine moly-type high speed tool steel brands indicated here are available to meet your requirements for quality materials. Tougher than the comparable tungsten types at equivalent hardness, they have found wide-spread acceptance among the users of high speed steels.

CONTACT YOUR LOCAL LATROBE REPRESENTATIVE

## LATROBE STEEL COMPANY

Latrobe, Pennsylvania

Sole Producers of "DESEGATIZED" Steels

BRANCH OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

ELECTRITE  
**6-6-M2**

ELECTRITE  
**HV-6**

ELECTRITE  
**TATMO**

ELECTRITE  
**TNW**

ELECTRITE  
**CO-6**

### "Don't Give Up the Ship's Subsidies"

**Navy, Maritime Administration oppose Weeks' request for merchant marine subsidy cuts . . . Foreign flag competition growing . . . Stress war imports—By G. H. Baker.**

Recently publicized lags in U. S. merchant marine operations give Congress doubts about proposals to cut federal shipping subsidies.

Commerce Secretary Sinclair Weeks has recommended substantial cuts in fiscal 1954 outlays for merchant ship construction and operation. The Senate, following his lead, has omitted all appropriations of federal funds for subsidizing new merchant ship construction.

**They Object . . .** But two defense agencies (Navy Dept. and Maritime Administration) say minimum war shipping requirements call for 214 new military and civilian seagoing vessels. This total includes 165 new cargo ships, 43 tankers, and 6 passenger vessels.

Minimum U. S. operating fleet in time of war should include 1287 dry-cargo vessels, 428 tankers, and 26 troopships, according to Pentagon transportation officials.

**Must Import Much . . .** Navy is citing the recent Paley Commission disclosures on U. S. dependency upon foreign sources of strategic materials. Because the U. S. is a have-not nation with respect to supplies of many raw materials a strong merchant marine for ferrying scarce commodities from foreign bases to this country is vital. The admirals cite these examples:

U. S. tin consumption in 1950 was 104,160 net tons, with all new supplies coming from overseas. Steel production that year required 1.8 million net tons of manganese ore, over 90 pct of which was imported.

Chromium users were similarly dependent on foreign sources. Nearly all the 1950 consumption

of 980,000 net tons of chromite came from Turkey, New Caledonia, Africa and the Philippines.

Sudden outbreaks of past wars have called forth hastily improvised shipbuilding programs. Ships built under these programs have been both costly and ill-suited for postwar commercial operation. The U. S. today owns 1713

#### Fairless Favors EPT

Support for President Eisenhower's stand that the excess profits tax must be continued for 6 months came from an unexpected quarter last week. After a visit to the White House, Benjamin F. Fairless, U. S. Steel Corp. chairman of the board, lined up with the President.

When asked his opinion on EPT he said, "I told the President that while it would cost my corporation a very sizable sum of money, I was in favor wholeheartedly of continuing it the remainder of this year."

Liberty ships, of which 1471 are laid up because they are too slow or too inefficient to meet military needs or to compete.

**Cut Atom Costs . . .** New reductions in atomic energy costs, strengthen possible eventual displacement of coal and gas as power-generating agents.

Atomic energy cannot today compete economically with either coal or gas as a power source. But recent strides in atomic research suggest that power from fissionable materials will, in the near future, be brought down to a cost where industry can seriously consider its use.

**Get Started Now . . .** "Atomic power today is much closer at hand than was the general use of electric power from conventional fuels when Thomas A. Edison built an electric generating station," Senate-House Atomic Energy Committee was told recently by James W. McAfee, president, Union Electric Co. Union is currently working with Monsanto Chemical Co. as one of five industrial teams exploring commercial possibilities of atomic energy.

Industry should take a close look now at non-military atomic energy uses, suggests Rep. W. Sterling Cole, R., N. Y., chairman of the Senate-House group.

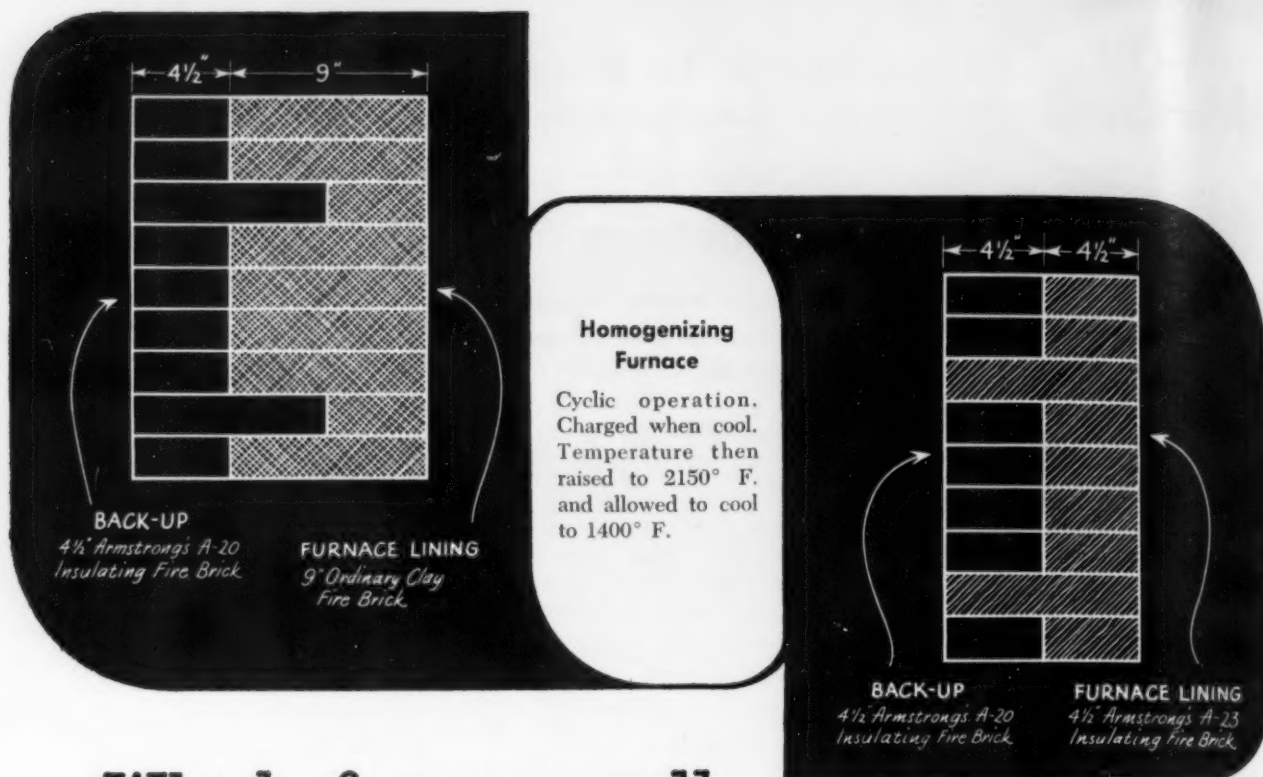
"Industry is justified in getting started now in order to be ready to capitalize in whatever improvements become available in the next few years," Mr. Cole reasons.

**Cut Industry Research . . .** Army, Navy, and Air Force industrial research programs may be headed for a 25 pct budget cut, if Defense Secretary Wilson decides to go ahead with tentative plans for trimming all but the most essential government-backed scientific studies.

Mr. Wilson has ordered each of the three military services to submit detailed lists of current projects. One list is to present those tagged for a "must continue" schedule. A second list will include those which could be dropped if necessary.

**Boondoggling . . .** Only the "most fruitful" projects are to receive official clearance in the future, Mr. Wilson says. Last week he declared bluntly that much Defense Dept. boondoggling is disguised as "research."

President Eisenhower's proposed research budget is listed at \$1.3 billion. If Mr. Wilson decides to go ahead with a 25 pct reduction this would still leave the armed services \$1,299,675,000 for research purposes.



## Which furnace wall produces Faster Heating Cycles?

Here are two possible constructions for the wall of a homogenizing furnace.

In the design on the left, the furnace lining is regular fire brick backed up with Armstrong's A-20 Insulating Fire Brick. With this construction, the heat loss through the walls would be 595 BTU's per square foot per hour. The heat capacity, or heat storage, would be 51,232 BTU's per square foot of wall area.

Now, look at the construction of the wall on the right. The back-up insulation is still 4 1/2" of Armstrong's A-20's. But the original 9" of regular fire brick has been replaced with 4 1/2" of Armstrong's A-23 Insulating Fire Brick. These rugged insulating brick can be used directly exposed. Heat loss through this wall is only 412 BTU's per square foot per hour—a 31% decrease.

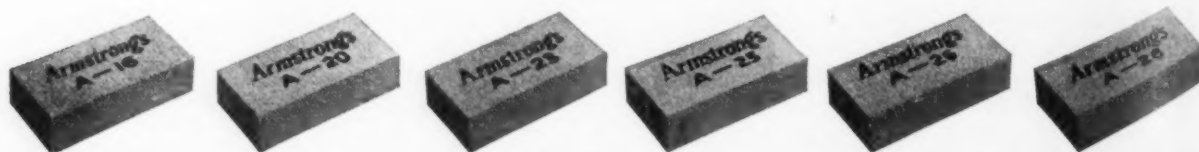
Even more important is the reduction in heat storage. The low specific heat of the Armstrong's

refractories in this second wall cuts the heat capacity to only 11,251 BTU's per square foot of wall area. This is a 78% decrease in the non-productive heat wasted in the furnace walls.

Result: faster heating cycles with increased production and lower fuel costs, because the furnace reaches its top operating temperature much sooner and cools off much more rapidly.

### Do you have a furnace problem?

Choosing the right brick calls for a sound knowledge of brick performance and furnace construction. That's why it's a good idea to call on the Armstrong engineer whenever you have a refractories problem. He'll study your conditions and help you select the best brick for your particular job. To have him help you, just call your near-by Armstrong office or write to Armstrong Cork Company, 2706 Susquehanna Street, Lancaster, Pennsylvania.



## ARMSTRONG'S INSULATING REFRACTORIES



## ADS: Can Help Fight Communists

**Business-sponsored advertisements on U. S. way of life in foreign publications help combat Red lies . . . Commies peddle same old stories in all areas—By R. M. Stroupe.**

Latest ideological weapon in the battle against Communist propaganda abroad is paid advertisements by businessmen of America in foreign publications and overseas editions of U. S. periodicals.

Business leaders are cooperating with the State Dept.'s Private Enterprise Cooperation staff and the Advertising Council to develop effective material on the American social and economic system.

### Sing Same Old Song

One project in which businessmen and State may take pride is the highly successful industry-operated program of private magazine collection and distribution (IRON AGE, Mar. 12, p. 75). It's producing excellent results, has proven extremely popular.

In consultation with the U. S. Information Service, State Dept., the Advertising Council had a look at methods used by the Reds to present misinformation on the U. S. and its customs. Certain false themes, it found, were being hammered on, no matter whether Europeans, Asians, or Africans were the targets.

### What to Do

Some suggested methods of presenting glimpses of U. S. life in consumer and institutional advertising are these:

¶ Provide space for comments and photographs of some of a firm's small stockholders;

¶ Show in graphic form what a worker receives in the form of money or buying power for each hour he's on the job;

¶ Call attention to the programs under which the worker may draw incentive pay raises, disability compensation, and additional benefits contributing to his economic security;

¶ Outline the constitutional guarantees insuring the liberties of the law-abiding.

Some of the arguments the Communists are continuing to howl about, and a few calm answers of the type the Council suggests might be used in reply, are these:

**False—A handful of families in the U. S. live luxuriously, but the vast majority toil for starvation wages.**

**True—Americans enjoy a standard of living astonishing to any foreign traveler who visits here. Certainly the percentage of very wealthy people is small, but the average wage earner has at his disposal goods and services which, if they exist at all in other countries, can be obtained only by the extremely affluent individual.**

**False—Production and distribution facilities are clutched in the grasp of a privileged few, who seek to further their monopolistic control.**

**True—Thousands of small stockholders are the owners of most of our large corporations. These people, and not some mythical ogre called Big Business, are the ones who take the blame for all sorts of non-existent economic imperialism attributed to this country by the Communists.**

**False—Only the accident of geography, carrying with it great supplies of mineral wealth, water power, and arable**

land, made the U. S. a rich nation.

**True—Our stores of natural resources would have remained unharnessed had it not been for competitive enterprise and the use of mass-output techniques. Skillful application of sound methods of development and production has been the key to success in industry, commerce, and agriculture.**

Companies trying to sell both their products and a sound understanding of America are getting first-class results with judicious overseas advertising. They aren't stopping with ads alone, but are wrapping up the same ideas in industrial films, publicity releases, product exhibits, and pamphlets placed in packages bound for foreign ports.

## More Aluminum in Third Quarter

Forty-five thousand tons of primary aluminum will be made available by three aluminum producers during the third quarter to independent fabricators.

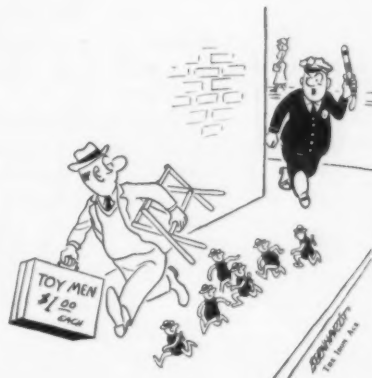
This is over and above stockpile buying and set-asides for national defense programs. In announcing the figure, General Services Administration points out that the amount is 9000 tons over the quantity primary producers are required to offer independent fabricators.

### Offer to Independents

General Services Administration has supply contracts with Alcoa, Kaiser, and Reynolds. These require that two-thirds of all aluminum produced by new facilities, less amounts charged to government requirements, is to be offered first to independent fabricators.

GSA now estimates that third quarter primary aluminum production will be more than 325,000 tons, of which about 10,000 tons will come from new facilities.

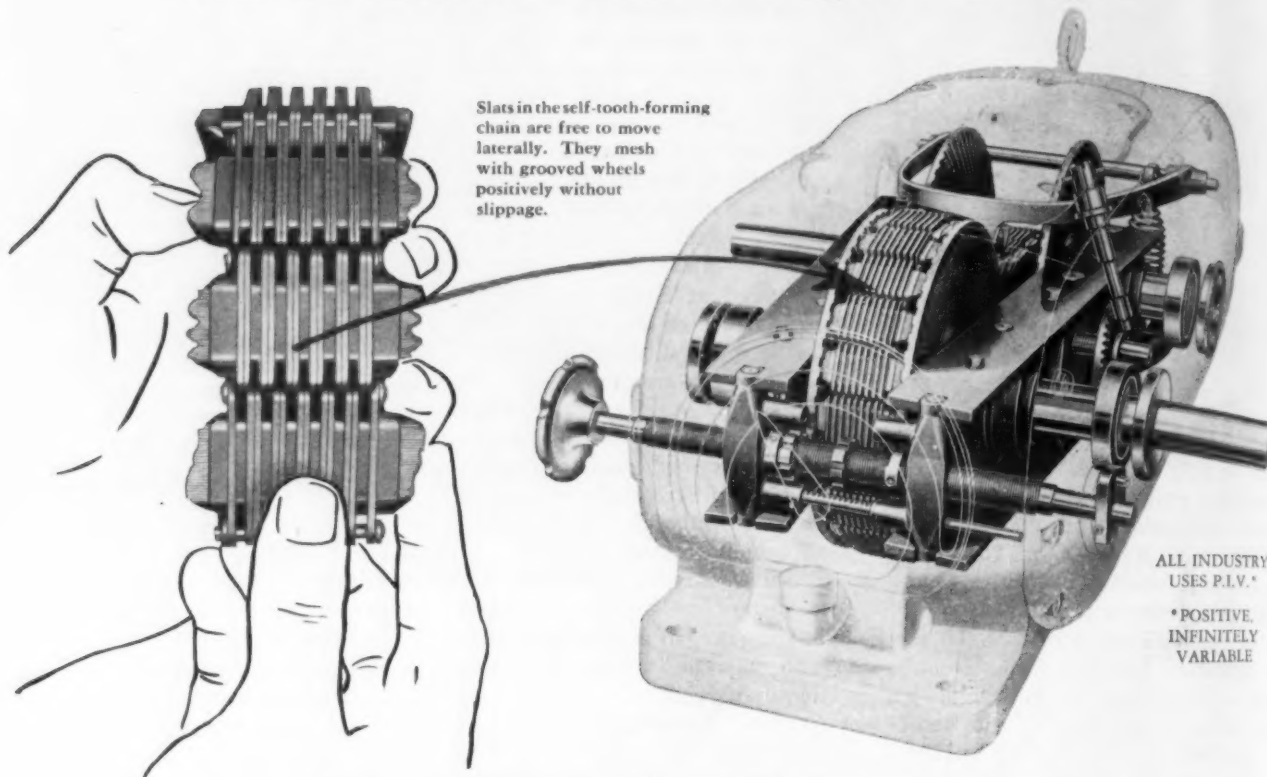
First two rounds of aluminum expansion are estimated at about 75 pct complete. Completion of the new plants now scheduled is estimated to bring capacity close to 1.5 million tons of the light metal per year.



# Completely **POSITIVE**...

# Completely **STEPLESS**

with an infinite number of speed changes



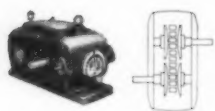
Slats in the self-tooth-forming chain are free to move laterally. They mesh with grooved wheels positively without slippage.

ALL INDUSTRY  
USES P.I.V.\*

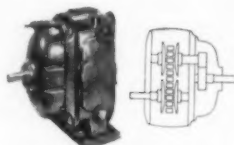
\* POSITIVE,  
INFINITELY  
VARIABLE

## P.I.V. Variable Speed Drive gives you exact selection from maximum to minimum speed

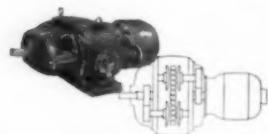
4 of 16 P.I.V. types, 1/2 to 25 hp. — ratios to 6:1  
Horizontal or Vertical Mountings



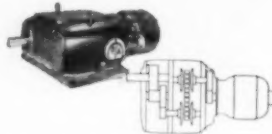
Basic Positive, Infinitely Variable Speed Drive. Compact.



P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with single reduction input and double reduction output helical gears.

ONLY Link-Belt's P.I.V. Variable Speed Drive uses self-tooth-forming chain to provide positive, stepless speed changing. The chain meshes with grooved wheels, transmits power without wasteful slip.

What's more, Link-Belt's P.I.V. changes speeds accurately under full load, delivers full-rated horsepower to your machines. That's because P.I.V. is not dependent on friction for power transmission. Its all-metal construction is not affected by atmospheric conditions.

Adjustment is easy. You can obtain an infinite number of speeds with manual, electric, pneumatic or hydraulic controls... hold the exact speed you need at any setting.

There may be a process in your plant that requires exact, variable speed transmission. If so, it will pay you to contact your nearest Link-Belt office. They'll show you how P.I.V. can increase the flexibility and efficiency of your machines. Send for Catalog No. 2274.

**LINK-BELT**  
P.I.V. VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

## Western Steel Mills Keep in Step

**West Coast steel producers follow national price, labor pattern . . . Most price hikes stop at competitive average of \$4 per ton . . . Some items soft—By T. M. Rohan.**

Western steel mills followed the national pattern on price changes and labor settlements last week.

U. S. Steel and Bethlehem wage contracts and prices were automatically settled on a national basis. Kaiser has held preliminary union meetings and will probably follow the national pattern. Smaller western independents, most of whom have contracts with later expiration dates, were also expected to fall in line.

**Still to Come . . .** Price increases generally followed the basic \$4-per-ton average announced by U. S. Steel. Some larger warehouses using their own costs announced new prices before smaller steel producers had finished figuring theirs. Many smaller warehouses have not yet completed new price lists based on the recent raise in extras.

Kaiser's prices, which include partial freight absorption, were raised to competitive levels. About 15 pct of the Fontana tonnage goes into tinplate which remained unchanged on long-term contracts. Plate increases averaged \$4 a ton.

Only decrease anywhere was Kaiser's hot-rolled sheets which went from 4.825¢ per lb to 4.70¢, again with partial freight absorption.

**Pigs Loose . . .** Western pig iron prices stayed unchanged despite a loose local market. U. S. Steel's smallest merchant iron furnace in Utah is banked and Kaiser is running its three blast furnaces on low wind with excess pig up for sale. Heavy foreign tonnage is also being offered on the Coast.

Reinforcing bar prices followed the rise despite their being the loosest western steel product. In Seattle, demand is waiting on dam

construction contracts. Los Angeles business is good, but if demand drops for finished products, larger mills could glut the bar market. The San Francisco area is loosest on the Coast but new prices are expected to hold the line.

**Eastern Pull . . .** Washington Steel Products, Inc., of Tacoma, Wash., is finding a lucrative market for its cabinetmaker's hardware in midwest and eastern markets. The firm currently has three shifts turning out hinges, catches, knobs and pulls, 52 pct of which go east of the Mississippi.

Last week, the firm revealed a \$1-million expansion which will double present employment of 180.

Major new operation will be metal plating, formerly jobbed out.

Pacific Northwest Alloys, Inc., of Spokane, a subsidiary of Chromium Mining & Smelting Corp. of Chicago, has leased the major part of Spokane's wartime government magnesium plant for production of ferroalloys. Magnesium reduction equipment will be kept in standby condition.

**Body Blow . . .** The two West Coast newcomers to aluminum took a body blow on the heavy press program cutback last week. (See p. 78.) Of the seven units cancelled, six were for Kaiser and Harvey Aluminum.

Each lost a 35,000 and 25,000-ton forging press; Kaiser also lost an 8000-ton extrusion press and Harvey a 20,000-ton extrusion press.

Although the West currently is producing 50 pct of all U. S. military airframes by weight, lone remaining presses will be the Harvey 8000-ton extrusion presses for Reynolds Metals at Phoenix, Ariz.

**Engineers Available . . .** President Leo J. Harvey said \$19 million worth of tools and buildings had been ordered on the \$28-million program but actual construction was held up by the Air Force for 6 months, indicating a cutback was coming.

What to do with 50 engineers gathered from the U. S. and Europe for the project is Harvey's most immediate concern, he said. Los Angeles area airplane plants still searching for good engineers will undoubtedly grab them.

Kaiser, which already has foundations in at Newark, Ohio, had no official statement but was believed hoping for a revival of the program at a later date. Its engineering was done mostly by outside firms.

**New Try . . .** The becalmed Pacific Northwest shipbuilding industry is trying to work up a fresh breeze.

### New Mill Steel Prices

Columbia-Geneva Div.,  
U. S. Steel Corp.

Effective June 17, 1953

(Dollars per net  
ton unless other-  
wise denoted.  
Extras apply.)

#### CARBON STEEL:

Plates	82.00 G
Structural Shapes	96.00 T, 82.00 G
Bars	97.00 P, T
Reinforcing Bars	97.00 P, T
Tie Plates	105.50 P, T
HR Sheets (18 ga & over)	92.50 P, T, 80.50 G
Galvanized Sheets, reg.	120.50 P, T
Hot-Rolled Strip	93.50 P, T
Cold-Rolled Sheets	114.50 P
Hot-Rolled Rods	103.50 P, 116.50 P

#### WIRE PRODUCTS:

Wire—ann'l'd merchant	152.50 P
Wire—galv. merchant	160.50 P
Wire—bright basic	129.50 P
Wire—M. B. high carbon spring	157.50 P
Wire—premier spring	151.50 P
Nails—non-stock	151.00 P
Staples—non-stock	153.00 P
Nails—stock	Column 150 P
Staples—stock	Column 152 P
Barbed & Twisted Wire	Column 173 P
Woven Wire Fence	Column 163 P
Bale Ties—single loop	Column 173 P

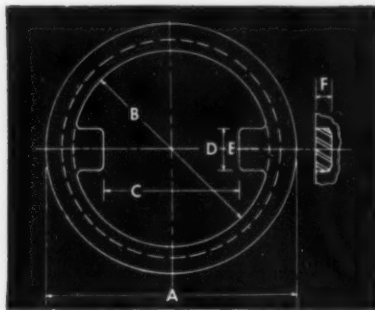
#### HIGH STRENGTH STEEL:

Man-Ten Hot-Rolled Sheets	109.50 P
Cor-Ten Plates	125.00 G
Man-Ten Plates	103.00 G
Abrasion Resisting Plates	105.00 G

KEY: P, Pittsburg, Calif., Works; T, Torrance, Calif., Works; G, Geneva, Utah, Works.



# Production time reduced by 53%!

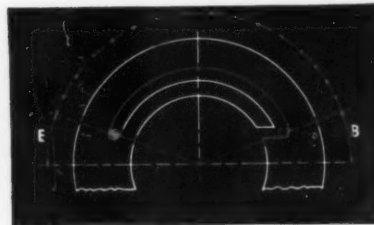


(A) 6" (B) 4 1/4" (C) 3 1/4"  
(D) 1"  $\pm$  .000  
(E) 1"  $\pm$  .005 (F) 3/8"



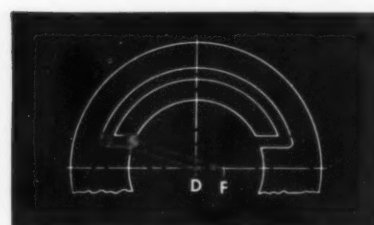
**OPERATION 1** — Rough mill one side of tongue.

**PROCEDURE**—Offset spindle slide radius (A), set rotary head to angle (B), feed table to work-piece centerline (C to D).



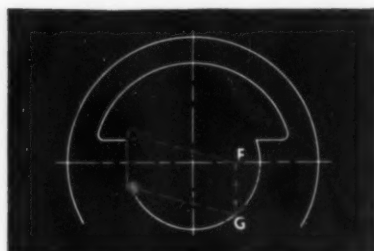
**OPERATION 2** — Rough mill radius section between tongue.

**PROCEDURE** — Rotate head from angle (B) to angle (E).



**OPERATION 3** — Rough mill one side of opposite tongue.

**PROCEDURE** — Feed Machine table from (D) to (F).



**OPERATION 4** — Rough mill end of tongue.

**PROCEDURE** — Feed machine saddle from (F) to (G).



## PRODUCTION DATA

**MATERIAL** — SAE 4615.

**CUTTER**—1/4 dia.—2 lip—HSS endmill.

**SPINDLE SPEED** — 600 rpm — (80 sur. ft./min.)

**LOT SIZE** — 25 to 50 pcs.

## Rotary Head Milling Machine simplifies method, cuts costs on still another production job.

**I**N the production milling of this Quick Change Clamp Collar, considerable savings were effected by using a Kearney & Trecker No. 2 Model D Rotary Head milling machine. The entire milling operation on each piece required less than 16 minutes and still maintained the prescribed accuracy. Previous time was 34 minutes.

The job was done faster on the Rotary Head machine than would be possible with any other method. The radii were produced merely by offsetting the spindle slide and rotating the machine's head. The straight surfaces were milled by moving the table and saddle, both of which are independent of the head setting. Only one cutter was used in this

single set-up. Think of what this means not only in this job, but also in terms of increased range of operations for other work.

Get the Rotary Head Milling Machine Production Idea Booklet. It contains several examples of how this method has been found exceptionally efficient in solving production problems. It's yours for the asking. Write Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.

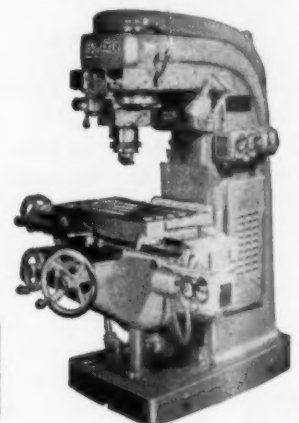
**OPERATION 5** — Rough mill second half of inner contour.

**PROCEDURE** — Repeat Operations 1 through 4, working area to be in the lower half of opening.

**OPERATION 6** — Finish mill 4 1/4" dia., end of tongues to 3 1/4" dimension and width of tongues to 1"  $\pm$  .000  $\pm$  .005.  
**PROCEDURE**—Reverse sequence of Operations 1 through 5.



**KEARNEY & TRECKER  
MILWAUKEE  
MACHINE TOOLS**



THE IRON AGE

# Machine Tool High Spots

## Builders See Gems in the Orient

**Japan's efforts to revive its industry may make it a major market for U. S. machine tools . . . Exports are already mounting . . . Germans compete—By E. C. Beaudet.**

Machine tool builders returning from the Far East are enthusiastic about the potentialities of the Japanese market. Within 5 years they claim it may well become one of the outstanding foreign outlets for American machine tools.

Japanese industry is just starting to get back on its feet. Its economy, running at a low ebb, needs the stimulating effect of world trade. To compete in the world market Japanese industrialists realize their industrial plant needs a thorough overhauling.

**Machines Are Old . . .** Since the war, plants that formerly turned out armaments have gradually returned to civilian production. These facilities contain a large number of obsolete machine tools, with an average of about 35 years. They received hard service before and during the war, and engineers in these plants are anxious to replace them with more productive equipment.

In addition to equipment, Japanese production methods need to be revitalized. Before the war the Japanese never understood production as we do in this country, but with their ability to imitate they are now trying to adopt American production techniques wherever possible. Improved workmanship is also being stressed.

**Industry Recovering . . .** Considerable progress is being made in rebuilding Japanese industry. Greatest activity is in the maritime, automotive and electrical industries.

Several large manufacturing programs now planned or underway are resulting in a greater number of orders to American machine tool builders and export-

ers. U. S. exports to Japan this year will be greater than last and are expected to increase materially within the next 2 to 3 years.

**May Make Autos . . .** At Nagasaki, an order from an American oil company for five tankers has the shipyards humming. One large industrial combine has a contract with Willys to turn out 5000 jeeps a month. This operation is scheduled to start in 2 or 3 months. The Henry J and the Hillman-Minx are now being assembled in Japan and may even be built there in a few years.

Added to these are orders from the U. S. Government for trucks. Passenger car and bus production is also increasing. A new shell producing facility for the U. S. Army is being setup with American presses. The electrical industry is stepping up its output of power generators and turbines.

**More Next Year . . .** To support this production orders are being placed in the U. S. for planers, gear shaving machines, crankshaft and crankpin grinders, hy-

draulic presses, gear hobbers and high powered knee-type milling machines. The volume is not large but it is increasing. Next year will be better.

The preference is largely for universal machines, although some interest is being shown in special equipment. Since labor is in good supply at low prices, it is more advantageous to keep operators and machines busy on a variety of work rather than shut down a special machine when holes in production schedules pop up.

**If Peace Comes . . .** Peace in Korea is of less economic concern to Japanese industrialists than regaining a share of the world market. Peace might mean withdrawal of American Forces which would intensify the dollar shortage. However, this loss might be offset by a resumption of trade with the Chinese mainland.

Greatest competition for the Japanese market seems to be coming from German machine tool builders. American visitors claim the majority of new machine tools seen in Japanese plants are of German make.

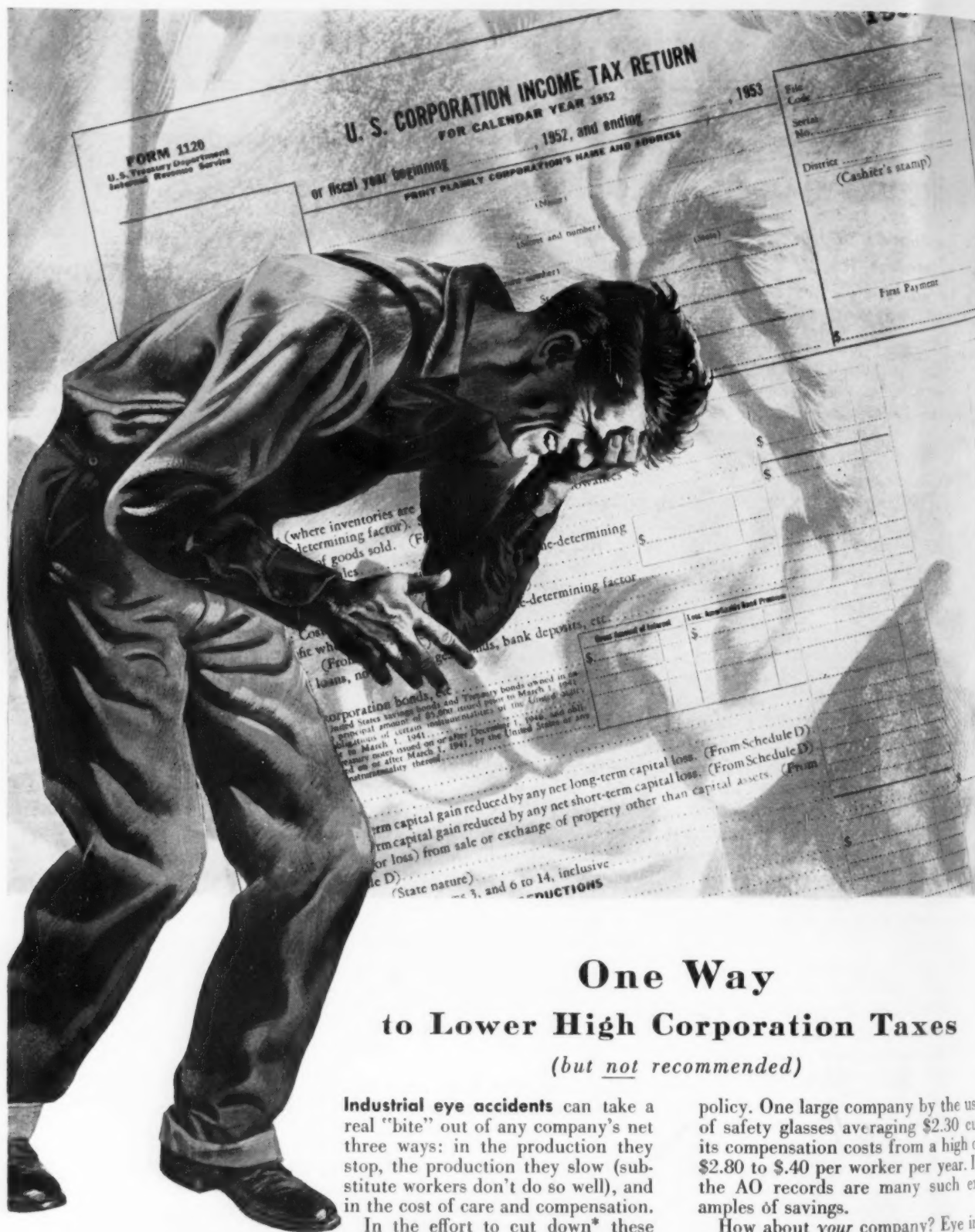
The German products are said to be cheaper, deliveries are better and they seem anxious to make deals. They are also said to be sending over more technical personnel to seek orders and help buyers set up their manufacturing.

**Norton Recovers . . .** The Norton Co.'s new Grinding Machine Div. plant is starting to look like its old self again after suffering \$1 million worth of damage from the tornado which hit Worcester, Mass., recently.

As of last week, 38 out of 40 departments in the Grinding Machine Div. were back in operation. Those departments still idle or in limited production are the pattern shop, casting cleaning and heavy milling. Though some machines have been shipped since the storm, 2-week delays are expected on others.

### MISS TOOL & DIE BEAUTY CONTEST





## One Way to Lower High Corporation Taxes (but not recommended)

Industrial eye accidents can take a real "bite" out of any company's net three ways: in the production they stop, the production they slow (substitute workers don't do so well), and in the cost of care and compensation. In the effort to cut down\* these avoidable taxes on profits, a program that safeguards a valued worker's eyes is sound

policy. One large company by the use of safety glasses averaging \$2.30 cut its compensation costs from a high of \$2.80 to \$.40 per worker per year. In the AO records are many such examples of savings.

How about *your* company? Eye injuries are as *certain* as death and taxes unless there is a program that controls them. Ask your AO Safety Representative for complete details.

American Optical



SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

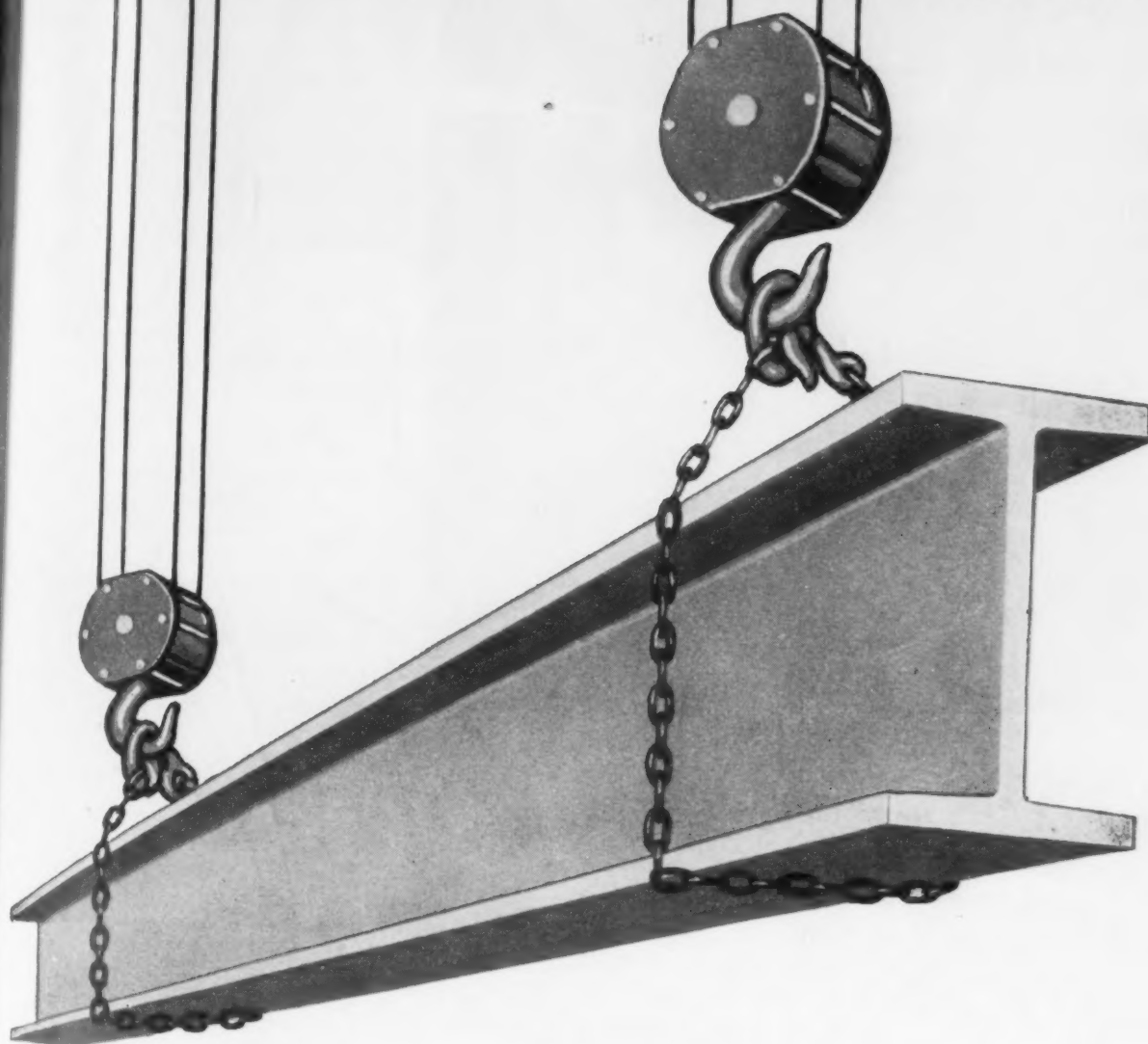
\*98% of eye injuries are eliminated when workers wear safety goggles.

AO's Industrial Vision Program Increases Production, Decreases Accidents. Write today for booklet "Improved Industrial Vision" to American Optical Company, 576 Vision Park, Southbridge, Mass.

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# STRUCTURALS...



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AS YOUR TELEPHONE



## Central Steel & Wire Company

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P. O. Box 5310-A  
REpublic 7-3000

DETROIT 12, MICH.  
13400 Mt. Elliott Ave.  
TWinbrook 2-3200

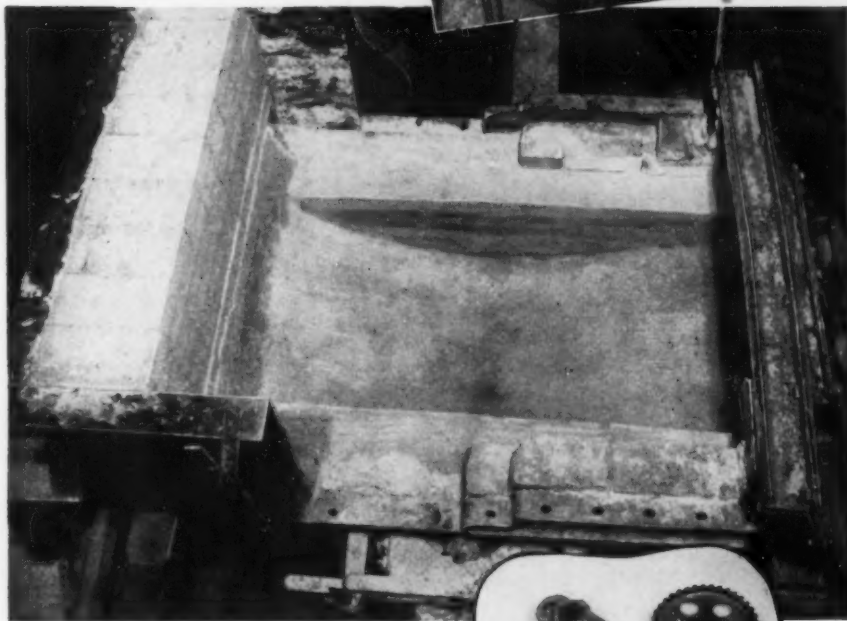
CINCINNATI 14, OHIO  
Box 148 Annex Sta.  
AVenue 2230

MILWAUKEE 14, WIS.  
6623 W. Mitchell St.  
IVergreen 4-7400

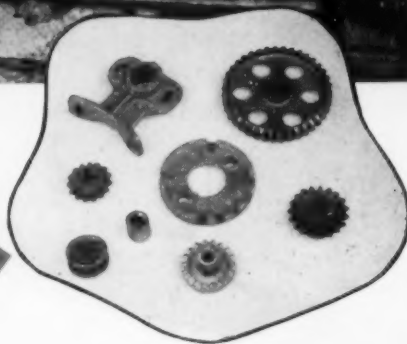
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Carbon & Alloy • Stainless  
Copper • Brass • Aluminum  
Expanded Metal • Structurals

# FRANTZ MFG. CO.

**USES  
SHAMVA<sup>®</sup>  
SM-65  
HERE**



**TO BOOST  
PRODUCTION HERE**



To produce the metal for their intricate washing machine parts castings, Frantz Mfg. Co., of Canton, Ohio uses a 1000 lb. Sklenar furnace. Gray iron is tapped at 2700° after a heat of 1 hour. Previous to using Shamva cement, Frantz was getting 53 heats with fireclay brick. After switching to Shamva cement, furnace life was increased to 203 heats, and this number has been repeated over and over for several years.

Shamva Mullite Cements, Brick and Shapes have been giving similar outstanding performances consistently. Perhaps you can profit from the Mullite story. Our field engineers will be glad to tell you about it.

**THE MULLITE REFRACTORIES CO.  
SHELTON, CONN.**

In Canada, Shamva Products Co., Ltd., Niagara Falls, Ontario.

## Free Publications

Continued

### Metal stampings

Facilities of Worcester Stamped Metal Co. for making various stamped metal products are pictured in a new circular. The company manufactures component parts and products in all shapes, sizes and workable metals, including carbon and stainless steel, monel, brass, bronze and copper, aluminum and titanium. *Worcester Stamped Metal Co.*

For free copy circle No. 13 on postcard, p. 97.

### Rubber-lined steel

Rubber-lined steel is the subject of a new brochure available from Metalweld, Inc. The method the company uses to line steel products such as tank cars, tank trucks, drums, pipe, valves and fittings with rubber to protect them from corrosion and abrasion is described. In addition there is a table of resistance characteristics of rubber linings. *Metalweld, Inc.*

For free copy circle No. 14 on postcard, p. 97.

### Reamer selector

Lavallee & Ide is offering a pocket-size reamer selector. This handy card lists 143 hole sizes from 0.4000 in. through 0.5010 in. which can be reamed with standard Lavallee & Ide reamers. The selector includes catalog numbers and equivalent sizes for easy ordering. *Lavallee & Ide, Inc.*

For free copy circle No. 15 on postcard, p. 97.

### Sheet lifter

The Jaeger automatic sheet lifter, outlined in a new booklet, operates from the crane cab, requires no men on the ground and is said to save up to 50 pct of floor space. A 30-day money-back guarantee is provided. *Jaeger Machine Co.*

For free copy circle No. 16 on postcard, p. 97.

### Wheels, casters

A series of data sheets is available on City Machine & Wheel Co.'s rubber-tired disc and caster wheels. Specifications and suggestions on the best uses of various size wheels and casters are given. *City Machine & Wheel Co.*

For free copy circle No. 17 on postcard, p. 97.

★ **Engineered for the tough jobs, too!**



From the heaviest roughing cut down to the finest precision cut, Axelson lathes are designed and manufactured to give precise, accurate service. Critical dimensions "stay put" because each Axelson lathe part is produced under strict metallurgical control. Recording pyrometers keep continuous time and temperature records of hardening, tempering and normalizing operations on gears, spindles, shafts, lead screws, etc. Quality built, Axelson lathes are capable of delivering dependable, accurate work under the most difficult operating conditions.

★ Axelson manufactures heavy duty engine lathes in 16", 20", 25", and 32" sizes of various lengths; precision tool room lathes; a 20" medium duty engine lathe; gap lathes.

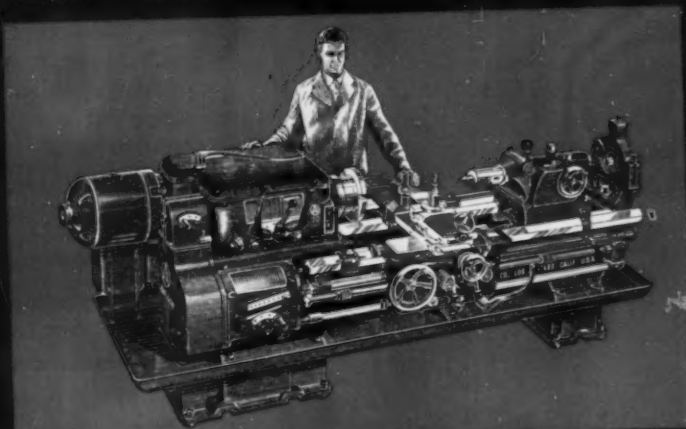
**AXELSON**  
*Lathes*

PSC

THERE IS NO ECONOMICAL  
SUBSTITUTE FOR QUALITY

Ⓐ

**CHOSEN FIRST.... TO LAST!**



TOOL ROOM LATHES • GAP BED LATHES • HEAVY DUTY ENGINE LATHES  
AXELSON MANUFACTURING COMPANY • Division of Pressed Steel Car Company, Inc. • Los Angeles 58 • New York 7 • St. Louis 16  
Authorized Distributors in All Principal Industrial Centers



# NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 97 or 98.

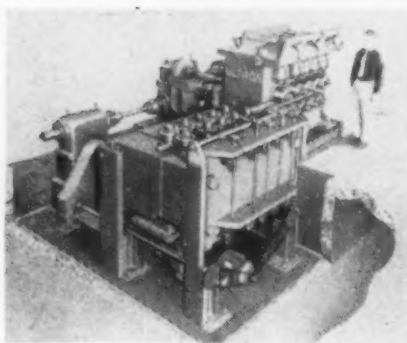


## Stacker crane provides high, safe lifting

With ease, containers or parts can be taken from storage shelves and delivered to point of use, and vice versa, with the new stacker crane. Operation is pushbutton controlled; placement is easy and quiet. The pendant mast upon which the fork is mounted rotates full 360°. One man can handle the entire stacking

and storage operations with speed and efficiency; has full visibility of lifting and storage at all times. The stacker crane can operate in very narrow aisles, permitting maximum use of storage space. The crane itself is overhead and out of the way. *Whiting Corp.*

For more data circle No. 18 on postcard, p. 97.



## Built for accurate straightening at high speeds

Availability of a new high-speed two-plane straightening machine for steel and nonferrous flats and shapes such as squares, hexagons, angles and similar sections has been announced. Known as the Sutton 2 1/2 L, the machine is built for accurate straightening at high production speeds from 100 to 1000 fpm. Extremely large roll shafts

on very close centers promote ease of straightening small sections, removing short hooks, and permit use of anti-friction roller bearings throughout. For speed of alignment, vertical and horizontal units are adjustable by pushbutton control of motor-driven screws. *Sutton Engineering Co.*

For more data circle No. 19 on postcard, p. 97.

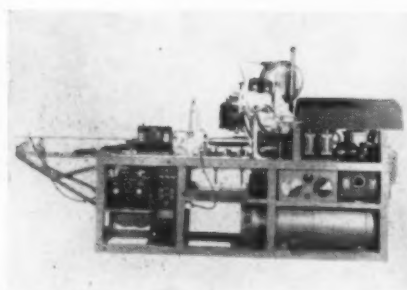


## Crane truck attachment proves practical sky-hook

One or two men can work safely and quickly at otherwise inaccessible overhead jobs with an ingenious attachment on the Hydro Sky-Lift crane truck. The boom can hold 500 lb safely and firmly at any point on the inside of a hemisphere of 26 ft radius, or 34 ft straight up in the air. The

crow's nest is fitted with a set of controls, hydraulically operated to insure positive and smooth action at any degree and in all directions. The Sky-Lift is mounted on a heavy duty chassis equipped with over-the-side outriggers for stability. *Yale & Towne Mfg. Co.*

For more data circle No. 20 on postcard, p. 97.



## Welder for shells uses consumable electrodes

A universal rotating band welding machine for projectiles makes use of a standard welding head that uses a continuously consumable electrode. A diversity of rotating bands can be applied by either a spiral or index feed of the head while the shell is rotated between

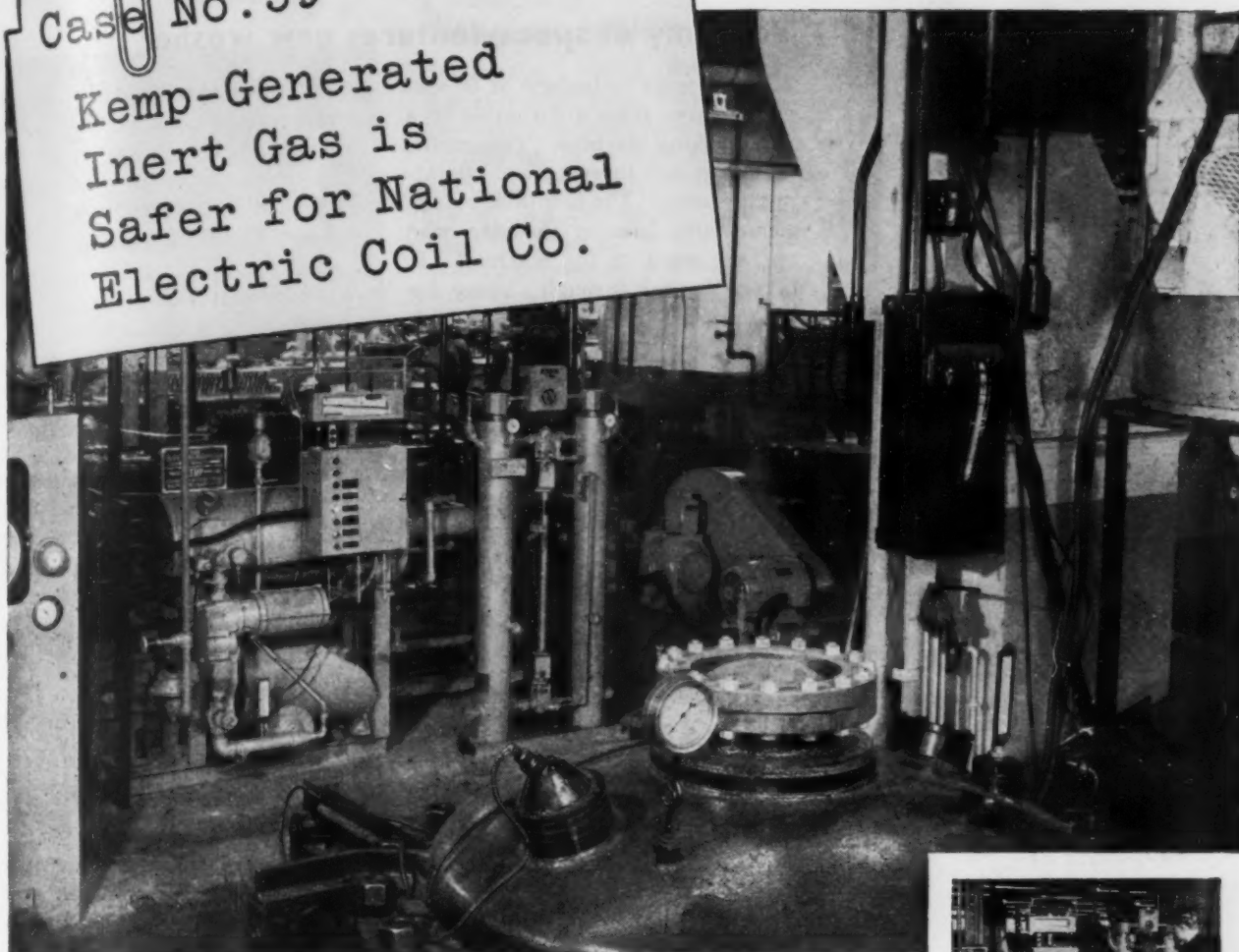
self-centering chucking adapters. Complete versatility of speeds and feeds is provided and the welding generator is incorporated in the frame of the machine making it an all-inclusive unit. *Morley Machinery Corp.*

For more data circle No. 21 on postcard, p. 97.

Turn Page

Case No. 59

Kemp-Generated  
Inert Gas is  
Safer for National  
Electric Coil Co.



## How National eliminates danger of explosion . . . cheaply and conveniently

National Electric Coil Co., Columbus, Ohio, impregnates electric coils and windings by forcing in a hot sealing compound with inert gas under pressure. Formerly, the Company used air under pressure, but this created an explosion hazard. National then switched to CO<sub>2</sub> generated by melting dry ice. Although this decreased the danger factor, it was an extremely expensive operation and very inconvenient. To modernize this process and cut costs, National installed a Kemp Gas Generator, Model MIHE.

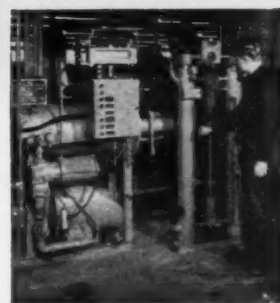
### Kemp Solved the Problem—and More

Now National's Kemp installation delivers a completely satisfactory inert—eliminating any danger of explosion. And it delivers it at a *much lower cost* than the former

generating method. In addition, Kemp supplies the gas at the rate required, plus a reserve for storage. As for convenience, the company considers their unit entirely automatic—it is practically never touched. According to Mr. D. E. Stafford, Chief Engineer, "It just sits there and operates."

### Kemp Can Solve Your Problem Too

Every Kemp Generator is engineered for fast-starting, easy operation that saves both *time* and *money*. Kemp equipment delivers a chemically clean inert at a specific analysis . . . without fluctuations regardless of demand. And every Kemp design includes the latest firechecks and safety devices. For convenience, safety, and cleaner, more dependable gas—specify Kemp.

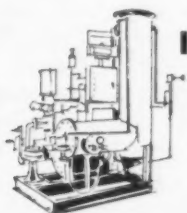


Mr. Wm. C. Graessle, of the engineering department, checking the operation.

Generator features the Kemp Carburetor, part of all Kemp equipment, to deliver complete combustion . . . without waste, without tinkering.

For more complete facts and technical information, write for Bulletin I-10 to: C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.

# KEMP OF BALTIMORE

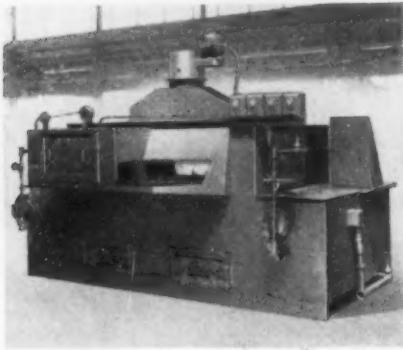


## INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS  
METAL MELTING UNITS • ADSORPTIVE  
DRYERS • SINGEING EQUIPMENT

## New Equipment

Continued

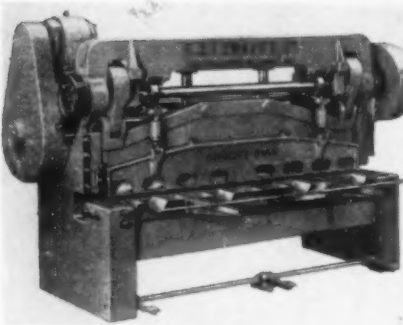


### Economy of space features new washer

Machine work in baskets or in special fixtures rides a turntable in a new washing machine. This means great savings in space and operating personnel. The turntable brings clean parts back to the man who put the work in the machine. It takes the work through a spray for washing and rinsing, and through the air blow-off section, back to the

loading-unloading station. Special motor driven pumps circulate the washing and rinsing solutions. Air, connected to the shop line, is controlled by automatic trip mechanism. The equipment can be furnished for steam use or gas heat, or in special explosion-proof construction. *G. S. Blakeslee & Co.*

For more data circle No. 22 on postcard, p. 97.

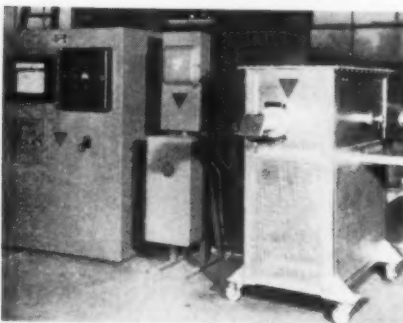


### High production rates possible with new shear

Quarter-inch mild steel plate up to 8 ft wide can be cut at rates from 45 to 52 strokes per min by a range of three overcrank-type power guillotines. The models were designed to provide extreme and sustained accuracy at high production rates, and long trouble-free running life with the minimum of blade re-

grinding. Accuracy is insured by an adjustable table squared with the end frames, which allows the shear blades to be kept in perfect alignment. Blades are alloy steel, ground with four cutting edges to minimize idle time during regrinding. *F. J. Edwards Ltd.*

For more data circle No. 23 on postcard, p. 97.

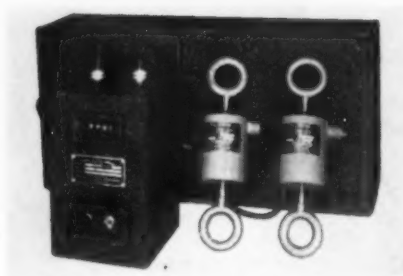


### Ultra-high temperature work possible in furnace

New 5000°F carbon resistor-type tube furnace offers ultra-high temperature work in the formation, fabrication or processing of ceramic or refractory materials. It is capable of rapid warm-up to 5000°F, reaching that temperature in approximately 2 hr. Even temperature zone of the tube furnace

is 12 x 3 in. ID with a full heated length of 26 in. Elements are water cooled and completely protected with fail-safe electrical interlocks. Provided with push-rod ports, this unit permits continuous or in-place firing on predetermined schedules. *Pereny Equipment Co.*

For more data circle No. 24 on postcard, p. 97.



### Electric crane scale speeds material handling

A fast, simple and accurate method of weighing while transporting has been devised for monorail and floor operated cranes. The Gilmore Model 116 electronic crane scale indicates with direct reading numbers, the weight of the material

handled by the crane. The method uses a Baldwin SR-4 load cell and Brown servo drive. No time is lost in weighing, and handling of materials is speeded up. *Gilmore Industries, Inc.*

For more data circle No. 25 on postcard, p. 97.



### Carton and drum handling without skid or pallet

Combination carton and drum clamp can handle both types of containers without the use of skid or pallet. The clamp arms shown are designed for handling load units of cartons. The slotted portion of the arms permits clamping of standard drums without interference of the drum's rolling ribs. Loads should have good dimensional stability; con-

tents should be of a non-fragile nature. A side shifting attachment permits accurate location of the clamp arms when picking up a load, or for accurate spotting of a load in confined quarters. Clamping and side shifting are hydraulically controlled. *Elwell-Parker Electric Co.*

For more data circle No. 26 on postcard, p. 97.

Turn Page



## New Equipment

Continued



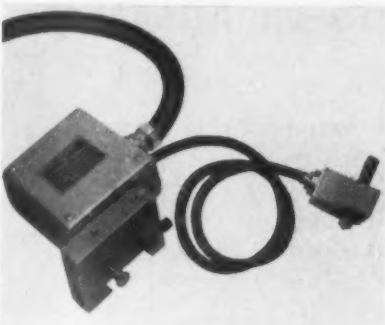
### Drilling and milling

Special machine tool is capable of drilling and milling 600 automotive connecting rods per hr at 100 pct efficiency. The machine has five stations: one for loading; one for milling the lock slot, and three for drilling the stepped oil hole. Parts are held on a fluid, motor-driven index table. Work holding fixtures are hydraulically operated. Use of pre-set cutting tools reduces downtime and minimizes scrap loss. *Cross Co.*

For more data circle No. 27 on postcard, p. 97.

### Diamond turner

An industrial diamond turner is a compact self-contained electro-mechanical device designed to automatically index the dressing diamond by positive, precise increments. This action will continually present a new sharp diamond edge



for each wheel dressing. It will rigidly support a standard shank diamond tool and provides ranges of indexing to meet all grinding requirements in odd increments of rotation so that the pattern of flats worn on the diamond will never repeat. *Industrial Diamond Co.*

For more data circle No. 28 on postcard, p. 97.

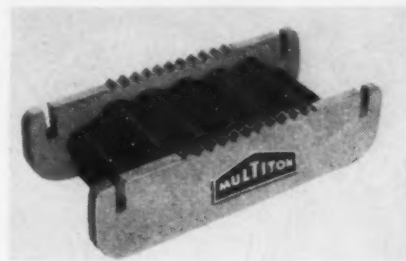
### Titanium tubing

Small size tubing drawn from commercially pure titanium has an 0.0455 in. OD; wall thickness, 0.00225 in. It is used for experimental work in the electrical, electronic and chemical industries. *Superior Tube Co.*

For more data circle No. 29 on postcard, p. 97.

### Roller skid

The Multiton roller skid for materials handling is basically a heavy duty dolly working on the self-laying track principle. It moves in the same way as a tractor or a tank moves. Consisting of a hardened cast alloy-steel frame with hardened roller forming the tank track and anti-friction ball bear-



ings between rollers, it supports tremendous weights, such as heavy machinery, and moves them easily over concrete and other hard floors. The load is almost entirely supported by compression, eliminating unsupported overhang. The Multiton is said to actually support 3200 times its own weight. *Stokvis Edera & Co., Inc.*

For more data circle No. 30 on postcard, p. 97.

### Heavy duty floor mat

Comfort and non-slip safety are claimed for a new rubber floor mat. Its molded design gives sure-footed traction and "rug" comfort quality. Durability is stressed by resistance to oil and grease, and the ability of the rubber formula to stand up under heavy foot traffic and cutting action of metal chips and other industrial floor hazards. Standard sizes are 32x32 in. or may be cut into 8-in. squares. *PB Div. Byron Jackson Co.*

For more data circle No. 31 on postcard, p. 97.

Turn to Page 110

# P&H

the industry's  
most complete line  
of cost-cutting  
welding equipment

### P&H POSITIONERS

With one finger, you position heavy weldments for economical downhand welding. Capacities, 2500 to 36,000 lbs. — remote-control and hand-operated models.



### P&H LOW-HYDROGEN ELECTRODES

13 types for high-strength welds on problem steels, steel castings, nickel-alloy steels, chrome-moly steels, .40 carbon castings, high-hardenable steels, aircraft and similar steels.



### P&H AC WELDER

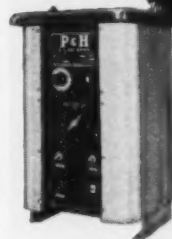
Exclusive P&H Dial-lectric Remote Control gives you instantaneous heat selection at the work. Sizes up to 625 amps., NEMA rated. Connectable to 220 and 440 volts.



### P&H WELDING TWINs

### P&H DC RECTIFIER WELDER

Also has P&H Dial-lectric Control, for fingertip heat control. Three sizes, 200, 300, and 500 amps., NEMA rated.



### P&H WN-301 ENGINE-DRIVEN DC ARC WELDER

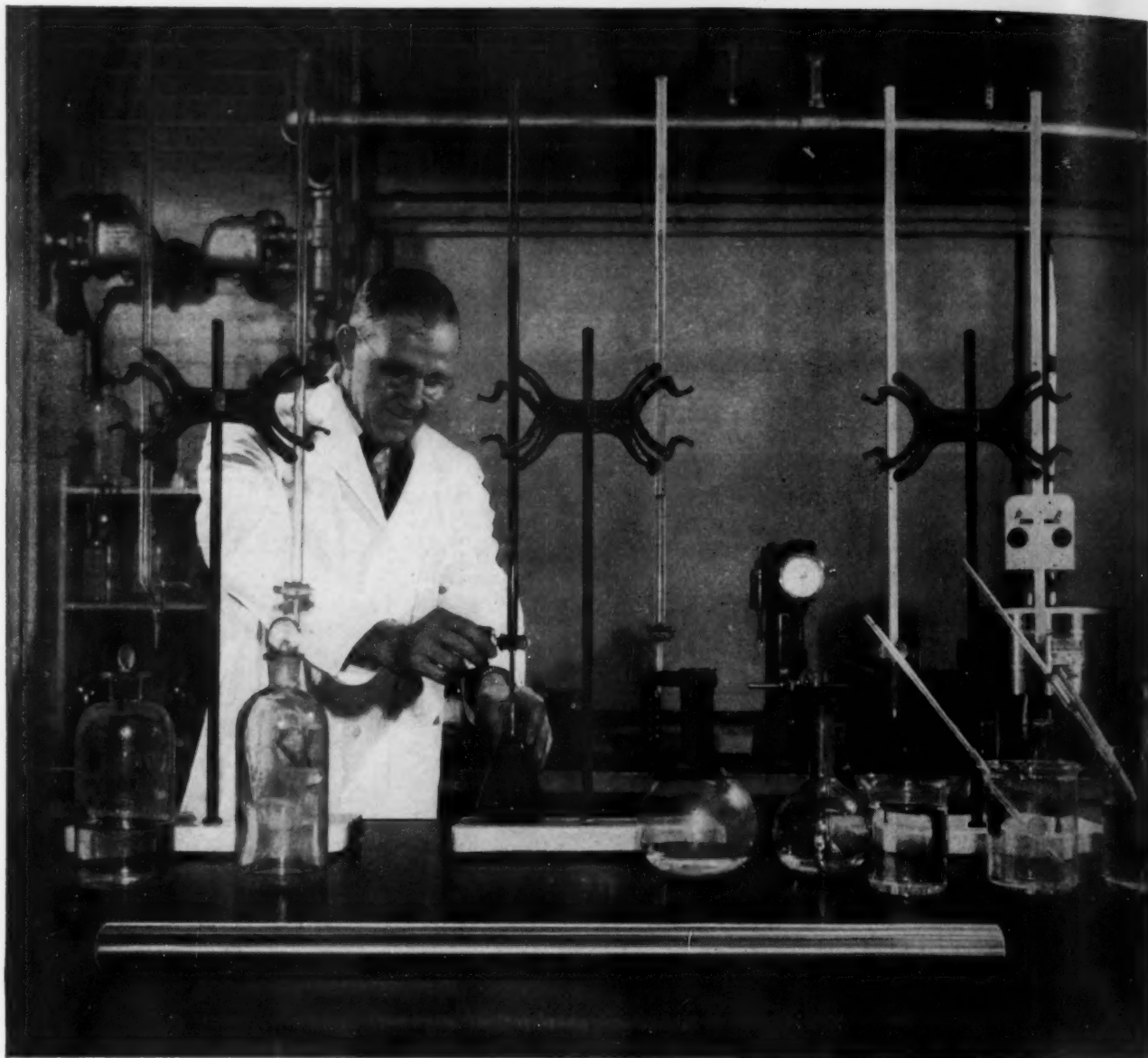
Portable—lets you weld anywhere, anytime. Has P&H Dial-lectric Control. Runs at only 1750 rpm. Welding service range, 60-375 amps., NEMA rated.



Ask your P&H representative or distributor for complete information, or write for free bulletins.

**P&H WELDING DIVISION**  
**HARNISCHFEGER CORPORATION**

4401 West National Ave., Milwaukee 46, Wis.



## Here's how we measure the "Muscle" in an Alloy Bar

Columbia alloy bars have muscle—and plenty of it. It's the kind of uniform strength that our many customers have learned to rely on, because each alloy bar is made to the same exacting standards as the last.

Only specially selected raw material is used. This material is subjected to a continuous series of tests (like the one shown

above) to verify its exact metallurgical content. What's more, each step of our production is rigorously Quality-Controlled by our laboratory to produce alloy bars that you can use in *your production* with minimum treatment and waste. • More product information—technical assistance, too—are yours for the asking. Call or write today.



*Columbia* STEEL & SHAFTING COMPANY

Pittsburgh 30, Pennsylvania

*SPECIALIZING IN COLD FINISHED STEEL BARS and SEAMLESS STEEL TUBING*

# Eaton Permanent Mold Gray Iron Castings—



for  
**HYDRAULIC  
CONTROLS**



Send for your free copy of the 32-page illustrated booklet: "The Eaton Permanent Mold Foundry." It tells the story of Permanent Mold Castings and takes you on a picture-tour of the Eaton Foundry at Vassar, Michigan.

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**PRODUCTS:** Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

June 25, 1953





## Weld it once and done no cracks, no porosity

Lightweight, tough, high tensile steels have made it possible for truckers to haul heavier loads with less dead weight—a decided economy.

No less important in saving time and money is the use of low hydrogen electrodes to weld these steels. When you weld low alloy high tensile steels—whether your requirements are tough or easy—Arcos Low Hydrogen Electrodes will consistently produce sound welds . . . welds that are free of cracks or porosity. There is no reworking of such welds—no chipping or re-welding to add more time to the job. The ability of Arcos weld metal to stand up in tough service—such as the strain on truck bodies of heavy loads or the impact of sudden stops and starts—is the result of high standard quality controls in the manufacture of Arcos electrodes.

Send for the free Arcos booklet, "The ABC's of Welding High Tensile Steels". Arcos Corp., 1500 South 50th Street, Philadelphia 43, Penna.

### ARCOS GRADE A. W. S. SPEC.

Tensilend 70	E7016
Tensilend 100	E10016
Tensilend 120	E12015
Manganend 1M	E9015
Manganend 2M	E10015
Nickend 2	E8015
Chromend 1M	E8015
Chromend 2M	E9015



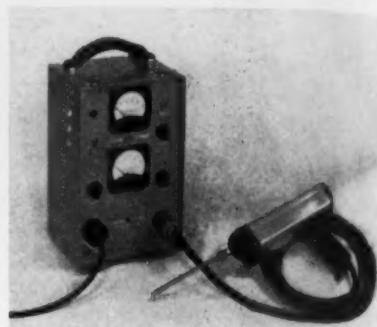
**WELD WITH**  
**ARCOS**  
**LOW HYDROGEN ELECTRODES**

## New Equipment

Continued

### Leak detector

GE's halogen-sensitive leak detector has been redesigned to permit easier detection of leaks in closed systems. Reportedly, the portable instrument can detect a leak so small that only 1/100 oz of gas will pass through the opening in a year. It tests for leaks in refrigerator



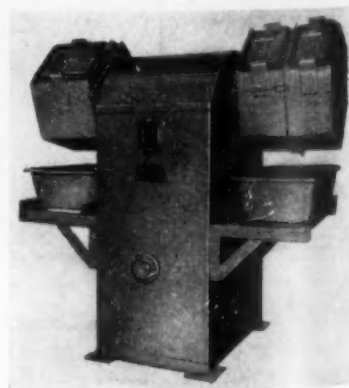
and air conditioning systems, tanks, boilers, piping and other products that must be leak proof and into which a halogen gas can be introduced as a tracer. A loudspeaker has been built into the control unit for audible indication of leaks. *General Electric Co.*

For more data circle No. 32 on postcard, p. 97.

### Burring barrels

To assist finishers who have many small lots of parts to deburr, a multiple burring barrel permits two lots of parts to be handled at the same time. And if two units are used on the Rampe twin finisher a total of four individual lots can be processed at one time. Multiple burring barrels are unlined or lined with vinyl plastic. *Rampe Mfg. Co.*

For more data circle No. 33 on postcard, p. 97.



THE IRON AGE

## Controlled corrosion

Corrosion in steam condensate systems, resulting from the presence of oxygen and acid carbon dioxide can be effectively controlled by use of a film-forming amine, Hagafilm, fed to the boiler in small amounts—2 or 3 lb per million lb of steam. Hagafilm, fed to the boiler, vaporizes with the steam and deposits a very thin, non-wettable protective film on all metal surfaces wherever condensation occurs and throughout the return system. All problems arising from condensate corrosion are thus minimized. Material is in solid and liquid forms. *Hagan Corp.*

For more data circle No. 34 on postcard, p. 97.

## Double universal joint

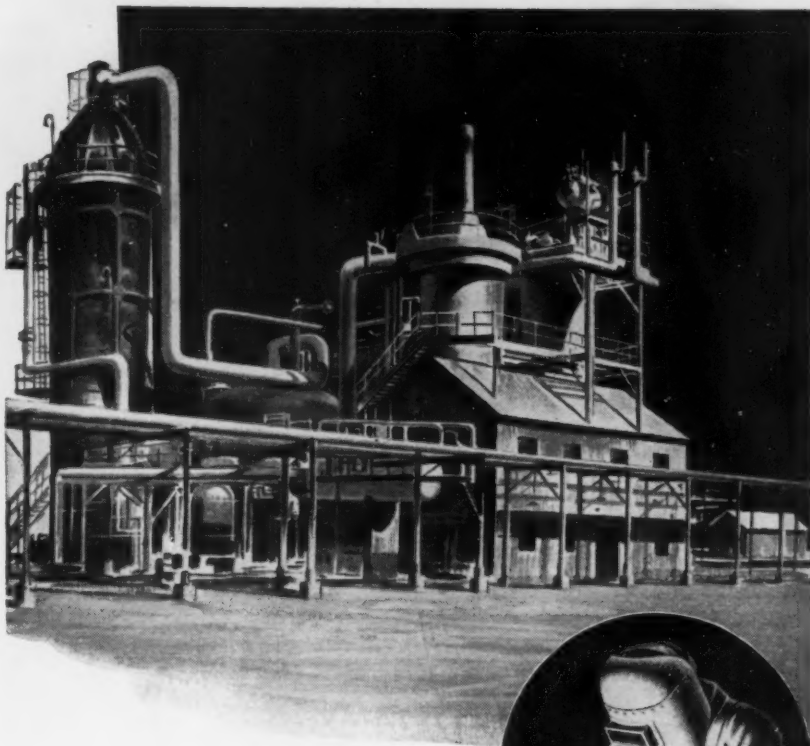
This double universal joint, measuring 35½ in. overall length, is one of several of this type designed and built for use in steel mills and on heavy-duty applications. The joint illustrated serves as the drive between gear box and a shear pinch roll in a large mill. Each of the two



universal joints measures 4 in. diam and is fully enclosed by a lubricant-retaining cover. Shielding of working parts permits satisfactory operation in mild acids, alkalis and excessive moisture prevalent in this type of application. Design of joint eliminates rotating seals subject to wear and eventual leakage. *Apex Machine & Tool Co.*

For more data circle No. 35 on postcard, p. 97.

Turn Page



When you want  
to **lick corrosion**  
for longer equipment life

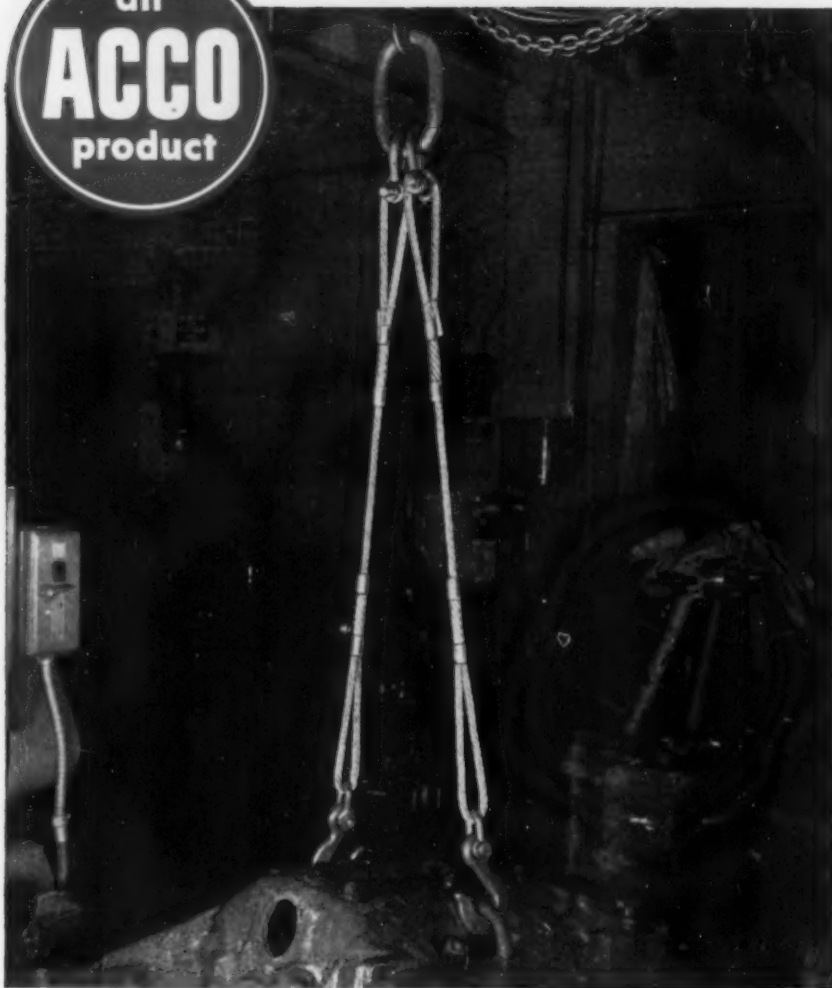
Getting good corrosion resistance starts with a base metal of desirable characteristics. However, maximum equipment life can be assured only when the welds possess the same corrosion resistance as the base metal.

ARCOS STAINLESS ELECTRODES are designed to deliver the results you need on *all* your welding jobs. Regardless of the requirements, there's a wide selection to provide the best suited electrode for every application. Because each is backed by Arcos quality controls, you have complete assurance of physically, chemically, and metallurgically sound weld metal. That means longer-lasting welds . . . less time and fewer dollars for maintenance. Write for your free copy of "What Electrode Would You Use?"

Arcos Corporation, 1500 South 50th St.  
Philadelphia 43, Pennsylvania



**WELD WITH**  
**ARCOS**  
**STAINLESS ELECTRODES**



## How ACCO REGISTERED Stock Slings Save You Money—with Safety

- 1 • **You Get ALL the Strength You Pay For**—DUALOC® Endings insure against any loss in the catalog strength of the preformed Green Strand wire rope the sling is made of.
- 2 • **You Lower Your Sling Maintenance Costs**—If damaged, any part of the sling can be replaced in your own shop with another ACCO Registered part of equal strength. No delay. You don't ship the whole sling to have one part repaired.
- 3 • **ACCO Slings are Stocked by Your Industrial Supply House**—His stock is based on YOUR needs. So, your sling inventory can be held to a minimum since your distributor's stock is as close as your telephone.
- 4 • **These Slings and Fittings are "ACCO Registered"**—This assures you of highest quality and safety throughout.

Write today to our Wilkes-Barre office for name of the ACCO Registered Sling distributor nearest you.

**ACCO**



WIRE ROPE SLING DEPARTMENT  
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles,  
New York, Odessa, Tex., Philadelphia, Pittsburgh,  
San Francisco, Bridgeport, Conn.

\*Trade Mark • Patent No. 2463199

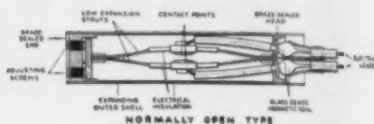
**ACCO  
Registered  
DUALOC  
Slings**

## New Equipment

Continued

### Heat detection system

Danger of fire around compressors and other belt driven equipment can be eliminated by the use of a simple shut-off circuit operated by a Fenwal Detect-A-Fire system. The detector breaks the power circuit when excessive temperatures



are reached as hot convection currents are swept past the heat detector unit by belt rotation. This safety cut-off system can be used with any type of belt driven equipment. However, the belt must be sufficiently enclosed so that the heat will be collected rather than immediately dissipated into the air. *Fenwal, Inc.*

For more data circle No. 36 on postcard, p. 97.

### Waterless hand cleaner

A liquefying, waterless hand cleaner removes dirt, grease, paints, oils, carbon, tar, shellac. Only a teaspoonful or two is required for one washing. It turns from a cold cream consistency to a liquid in a few seconds contact with the skin. Hands are rubbed briskly together, then wiped clean with a cloth or paper towel. No water is needed although it may be used. *E. I. du Pont de Nemours & Co.*

For more data circle No. 37 on postcard, p. 97.

### Chisels and punches

New cold chisels are forged from tool steel, hardened and tempered. Standard size chisels with cutting edge ranging from 1/4 to 1 in. have an octagon shank for better, non-slip grip and are given a polished finish. Extra long cold chisels are available with 5/8 to 1 in. cutting edges. Punches are made of octagon tool steel, hardened and tempered. Points and tapers are precision ground and heat treated. Six styles are available. *Billings & Spencer Co.*

For more data circle No. 38 on postcard, p. 97.

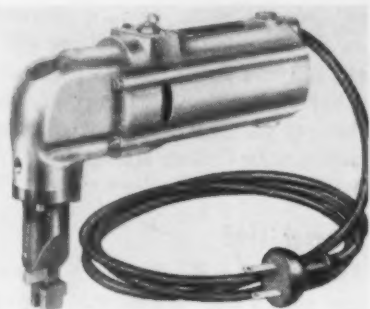


## Button head screws

Button head cap screws are being manufactured in sizes from No. 8 x 1/4 in. through 5/8 in. x 2 in. standard with NC threads. The purpose of the button head cap screw is to allow for smoother, more streamlined surfaces, which are desirable in many applications that do not permit countersinking. Rounded tops and flush edges prevent exposed sides. *Allen Mfg. Co.*  
For more data circle No. 39 on postcard, p. 97.

## Metal cutting tool

Wider application and adaptability have been engineered into an improved model of the Little Wonder nibbler. Greater rigidity and durability by means of a redesigned nosepiece feature the nibbler which incorporates a punch and die ar-

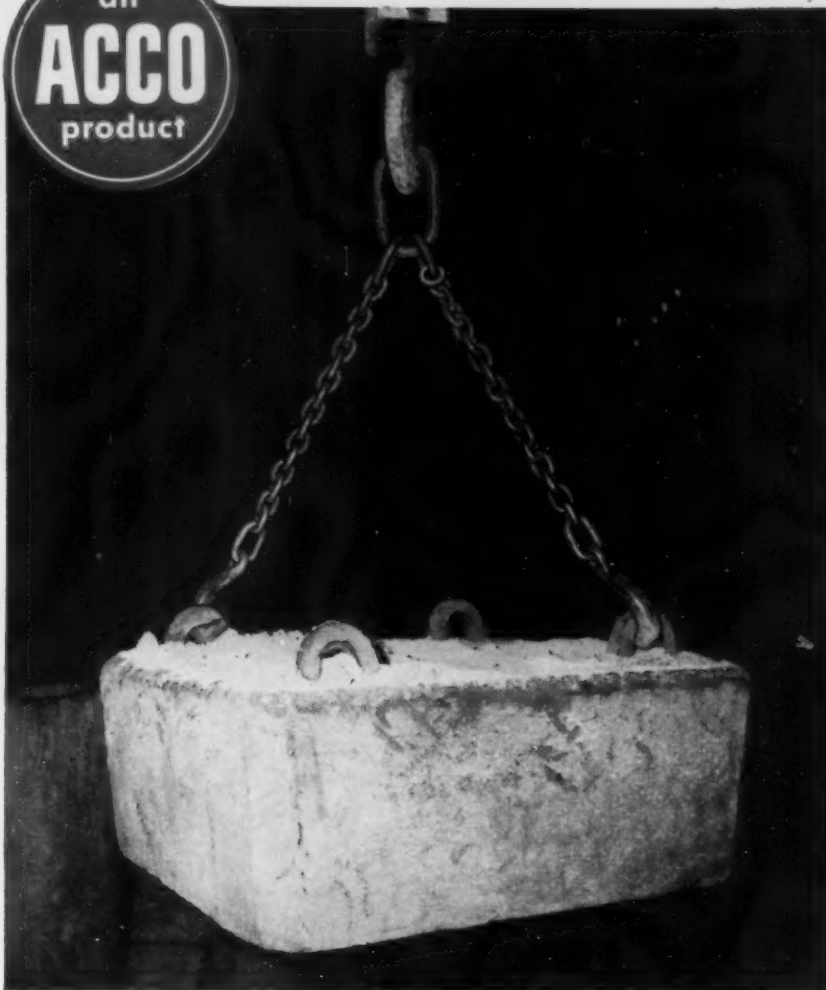


range for cutting metals, including stainless steel, up to 14 gage. Holes in tubes and ducts can be cut without damaging the original contours, because cutting pressure is applied only to metal being cut. The nibbler can be a hand tool or vise-mounted for production work. *Fenway Machine Co.*  
For more data circle No. 40 on postcard, p. 97.

## Sub presses

Paragon self-aligning sub presses for use with kick, arbor, air, or punch presses are said to increase the production capacity of every type of press by eliminating the need for complicated and time consuming setups for staking, piercing, bending, forming and assembling operations on small piece parts. Each operation can be tooled in a matter of seconds and the setup left permanently in the sub press. *Price Machine Products.*  
For more data circle No. 41 on postcard, p. 97.

Turn Page



## Why Workmen Like ACCO Registered Sling Chains

• One rigger said: "It's a neat factory-made unit that we know is made properly." A foreman said: "My men look for the identification ring. It's sort of a safety indicator."

Every ACCO Registered Sling Chain is built and tested as a unit and bears the ACCO identification ring. The sling illustrated above has ACCO Foundry Hooks designed for use on casting molds which get very hot. It is engineered for this particular job and will give long service. It is one of the many types of Registered Sling Chain made by AMERICAN to handle safely all kinds of lifting jobs.

Check today with your AMERICAN CHAIN distributor who will help you decide on the correct ACCO Registered Sling Chains for your use. Or, write our York, Pa. Office for a copy of DH-314 ACCO Registered Sling Chain Catalog.

ACCO

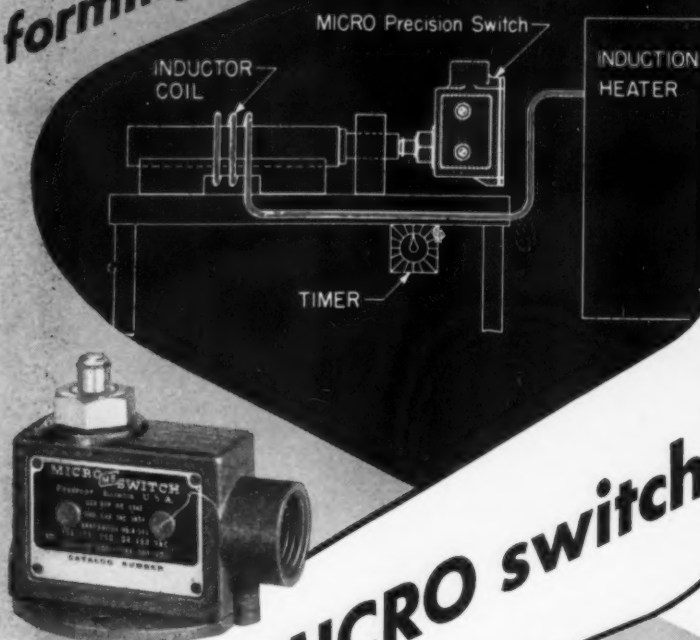


AMERICAN CHAIN DIVISION  
AMERICAN CHAIN & CABLE

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles,  
New York, Philadelphia, Pittsburgh, Portland,  
San Francisco, Bridgeport, Conn.

American  
Chain

**Bar stock  
forming operation speeded**



**with MICRO switch**

This MICRO switch performs two important functions in the induction heating of bar stock to form harrow teeth. It controls both heating and bar position.

Operator slides the bar down a grooved surface through a back stop until it contacts the switch plunger. This assures the proper position of the bar in relation to the induction heating coils. The switch then actuates a timer which starts the heating cycle. One man thus performs both the heating and pulling operations with utmost efficiency.

In thousands of plants, all over the country, engineers and maintenance men are using small, dependable, ruggedly-housed and easily-mounted MICRO switches to make their equipment safer, more automatic and more productive. Complete stocks of these versatile switches are readily available to plant operators from authorized MICRO distributors in 142 cities. Look under "Switches, Electric" in your classified telephone book.

Ask us to send you MICRO TIPS, a live publication packed with practical ideas to speed plant production.

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MAKERS OF PRECISION SWITCHES

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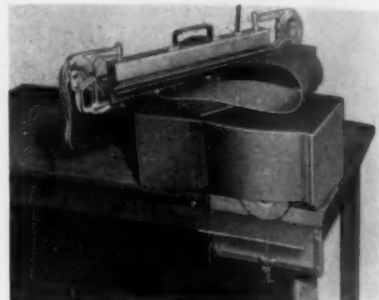


## New Equipment

Continued

### Abrasive belt splicer

Improvements and changes in the Econaway abrasive belt splicer increase the speed of splicing abrasive belts, improve quality of splice, save shop bench space and effect savings in abrasive belt costs. The motor, belt drive and grinding



wheel arbor are enclosed. Cutter and press bars are mounted on top of the enclosure so that operator can perform steps in splicing without moving from one station to another. An electrical curing press reduces the curing time from 24 hr to less than 60 sec. *Aget-Detroit Co.* For more data circle No. 42 on postcard, p. 97.

### Load lift

The 1953 Load-Lift is streamlined and simplified. Front axle support assembly and fifth wheel is made of certified malleable iron and incorporates as an integral part, the pivot for the handle holdup bracket. Upper head has been reinforced.



A new type semi-steel multi-ribbed wheel is standard equipment; multi-ribbing reinforces wide treads against breakage. All wheels are equipped with large bore sealed ball bearings. *Market Forge Co.*

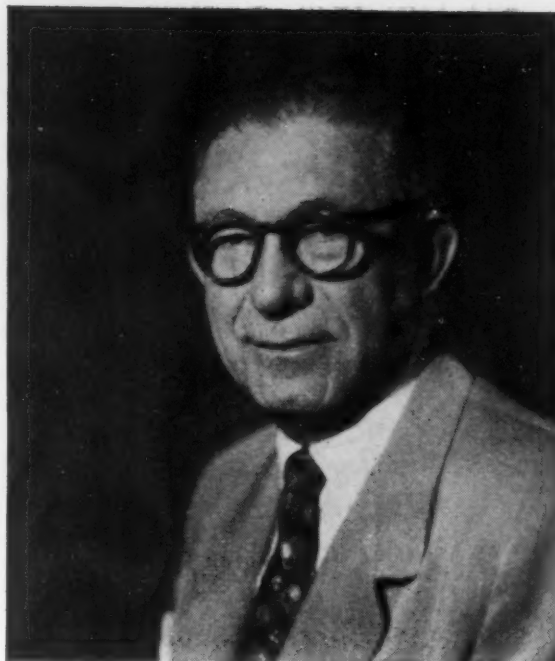
For more data circle No. 43 on postcard, p. 97.

# *The* **Iron Age**

## **SALUTES**

*Edward Gray*

This expert mixes music with his explosives for substantial benefits to both and his own profit.



**D**YNAMITE and Dvorak don't seem to have much in common. But Ed Gray gets pleasure and profit from both, has made substantial contributions to the advancement of each.

As president of Chicago Concrete Breaking Co., Ed is a world-renowned explosives expert. Credited with original techniques for precision use of explosives in servicing blast furnaces, openhearth and other steelmaking facilities, he has played an important part in iron and steel production by speeding up plant rehabilitation and reducing costly downtime.

A lifelong music lover and a hi-fi addict, he has pioneered these too. With a library of over 30,000 records, he has patented and is producing a new type phonograph which eliminates record-scratch damage. And he is now working on a radically different electronic organ.

His success story began in 1906. At the age of 14, he came to America on a cattle boat. After learning the machinist's trade, his progressive ideas and great energy resulted in a series of service companies, ranging from washing buildings to demolitions. In 1922 he founded his present company, the Chicago Concrete Breaking Corp.

Ed's slogan is "Wanted: The Hard Jobs." And an associate characterizes him as "a man with the true pioneering spirit."

He and his wife are proud of their five sons and two daughters. Three sons are associated with him in Chicago Concrete's activities.



Pour  
ingot  
moulds  
**RIGHT**  
in the pit

**WITHOUT  
ASSISTANCE  
OF CRANE**

**WITH...**



## GANTRY LADLE CAR

*relieves the "bottle-neck" caused by limited crane capacity*

The 85-ton Gantry Ladle Car pictured is "paying off" in an eastern steel mill by speeding up pouring and improving plant efficiency. You can save time and money by using this modern economical method of increasing tonnage output.

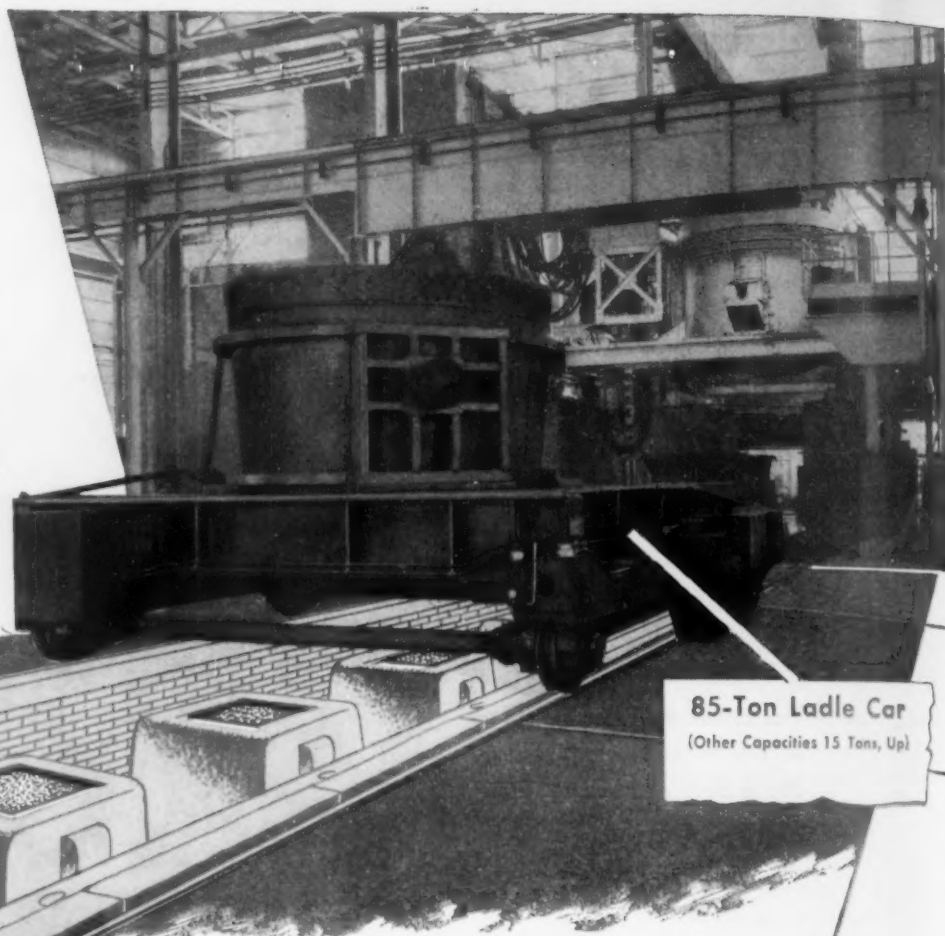
*✓ these features*

- ☐ Designed to Suit Your Ladle
- ☐ Sturdy Construction Throughout
- ☐ Positive, Simple, Push-Button Control
- ☐ Electric Motor Driven
- ☐ Moves on Track over Pit
- ☐ Roller Bearing Wheel Journals
- ☐ Easy and Economical to Operate

**The Youngstown Foundry & Machine Co.**

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

**Youngstown, Ohio**



**85-Ton Ladle Car**  
(Other Capacities 15 Tons, Up)

# The Iron Age

## INTRODUCES

A. C. Reppenhagen, elected president, THE MID-WEST ABRASIVE CO., Owosso, Mich.

Gordon Grand, Jr., appointed assistant to the president, OLIN INDUSTRIES, INC., East Alton, Ill.

E. H. Conner, appointed executive vice-president, PEDEN IRON & STEEL CO., Houston; and A. G. Peden, appointed vice-president and treasurer.

Harry T. Graham, named vice-president, GENERAL REFRACTORIES CO., Philadelphia; Richard E. Longacre, appointed general sales manager; and Gordon C. Fay, made works manager.

J. A. Hill, elected vice-president and sales manager, THOR POWER TOOL CO., Aurora, Ill.; and John A. McGuire, becomes vice-president in charge of labor relations.

Harold T. Reishus, named vice-president in charge of Industrial Power Div., INTERNATIONAL HARVESTER CO., Chicago.

Douglas B. Martin, elected to vice-president in charge of sales, Amplex Div., CHRYSLER CORP., Detroit.

J. A. Shimmin, made vice-president in charge of operations, ROTARY ELECTRIC STEEL CO., Detroit.

Frank X. Gilg, appointed executive assistant, Boiler Div., THE BABCOCK & WILCOX CO., New York.

L. I. Gilbertson, appointed director, Murray Hill, N. J., laboratories, AIR REDUCTION CO., and G. B. Carpenter, named manager of development staff in New York.

Berton E. Rogers, appointed vice-president in charge of manufacturing, Automotive Div., MOTOR PRODUCTS CORP., Detroit.

Edgar R. O'Brien, appointed assistant to the president, EDGCOMB STEEL OF NEW ENGLAND, INC., Milford, Conn.; and Frank L. McCann, named general sales manager.

Frank E. Foote, elected assistant secretary, MINE SAFETY APPLIANCES CO., Pittsburgh.

Lawrence Zeldin, made research chemist, Madison laboratories, BJORKSTERN RESEARCH LABORATORIES, INC., Chicago.

Richard M. Faulconer, promoted to group engineer, Salvage and Liaison Group, ENGINEERING & RESEARCH CORP., Riverdale, Md.; and Jerry Silberstein, named project engineer for flight simulator production.

H. H. Gorrie, named chief engineer, BAILEY METER CO., Cleveland.

Jesse J. Baum, appointed supervisor, AMERICAN CAST PRODUCTS, INC., Orrville, Ohio, a subsidiary of Hagan Corp.

J. Kenneth Salisbury, appointed professor of mechanical engineering, STANFORD UNIVERSITY, Stanford, Calif.

Harold J. Mink, appointed cost analyst and executive assistant, HENNEY MOTOR CO., INC., Freeport, Ill.

Raymond E. Scheubel, appointed tool design specialist, Electro Dynamic Motor & Generator Div., GENERAL DYNAMICS CORP., Bayonne, N. J.; and James J. Becher, named sales engineer, Chicago district.

R. B. Attridge, appointed head of Manufacturing Engineering Div., AINSWORTH MFG. CORP., Detroit.

Edward A. Parker, named assistant superintendent, plate and hot strip mills, KAISER STEEL CORP., Fontana, Calif.



NORMAN W. FOY, elected vice-president in charge of sales, Republic Steel Corp.



CARL B. DAHLBERG, elected a director and vice-president, American Pipe & Steel Corp., Alhambra, Calif.



L. S. HAMAKER, appointed general manager of sales, Republic Steel Corp.

## Personnel

Clarence E. Pink, elected chairman of the board and chief executive officer, THE CAMBRIDGE WIRE CLOTH CO., Cambridge, Md.; and Edward N. Evans, elected president.

Harry C. Slagle, becomes manager of shop training program, ALUMINUM CO. OF AMERICA, Pittsburgh.

Thomas A. Daly, appointed manager of technical operations, Aviation Gas Turbine Div., WESTINGHOUSE ELECTRIC CORP., Philadelphia; Hewett R. Arnold, named assistant manager; and Joseph F. Chalupa, becomes manager of manufacturing plant, South Philadelphia.

Carl Solby, promoted to works manager, EASTERN BRASS & COPPER CO., INC., New York.

Joseph T. Galvin, appointed sales manager, Plastics Div., FABRICON PRODUCTS, INC., River Rouge, Mich.

John J. McGonagle, appointed manager of steel sales, EDG COMB STEEL CORP., Hillside, N. J.

Charles P. Reynolds, appointed comptroller, TRAILMOBILE, INC., Cincinnati.

S. T. Williams, named works manager, ROSAN, INC., Newport Beach, Calif.

R. J. Loskill, promoted to manager of Sales Development Div., CATERPILLAR TRACTOR CO., Peoria; W. E. McCoy, becomes manager of Sales Training Div.; J. G. Thacker, promoted to assistant sales manager of Eastern Sales; and H. J. Hunkele, becomes assistant manager of Central Sales Div.

Robert E. Baxter, appointed sales manager for truck bodies and special equipment, FRAUEHAUF TRAILER CO., Detroit.

F. W. Thayer, becomes works manager in charge of foundry operations, GUNITE FOUNDRIES CORP., Rockford, Ill.



EDWARD G. BUSCHOW, elected president and manager of sales engineering, Fab-Cor, Inc., Pittsburgh.



WILMOT F. WHEELER, JR., named assistant to the president, American Chain & Cable Co., Inc., Bridgeport, Conn.



JOHN F. HALLER, named vice-president in charge of engineering, Allied Products Corp., Detroit.



LAURENCE C. JOHNSTON, appointed vice-president, Brown Finetube Co., Elyria, Ohio.

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*the Assembly Line*

Euclid Cranes prove an important link in the chain of operations required to convert incoming materials into outgoing products in a vast number of manufacturing plants.

Facility of movement through ease of precision control enables "Euclids" to handle a large variety of production operations, and to readily "pace" the assembly line. Write us concerning your crane problems. We'll be pleased to submit a proposal.

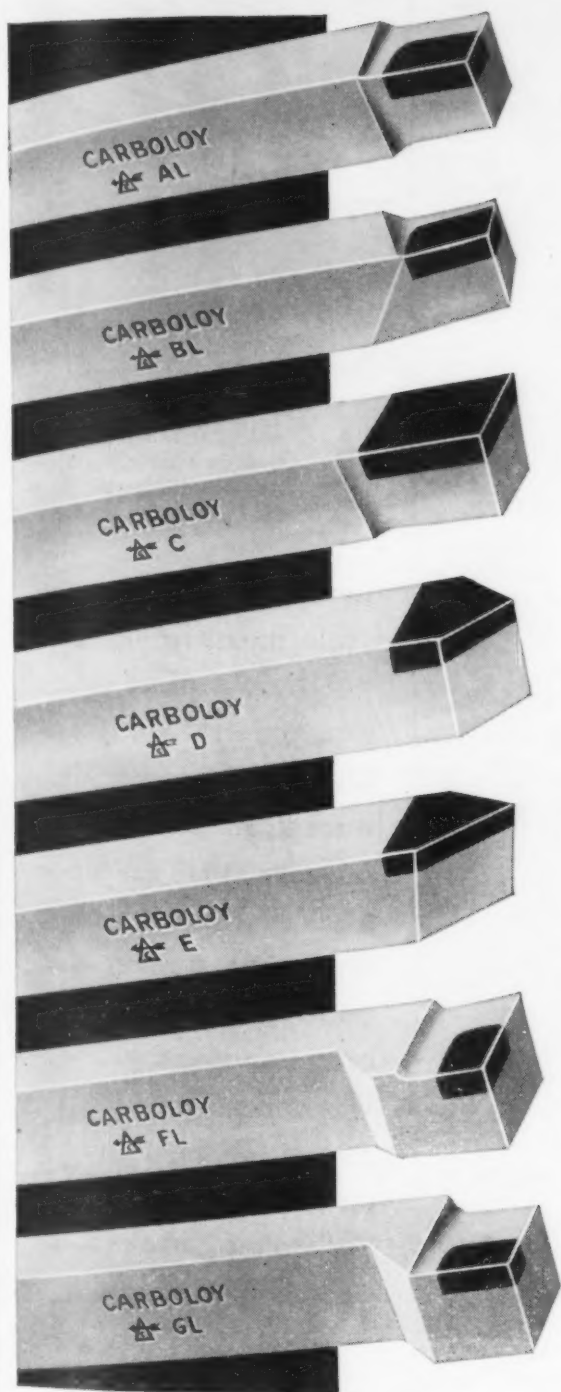


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**STANDARD CARBOLOY TOOLS** (right-hand styles not shown): over 15 million of these famous carbide tools — for 80% of all single-point tool applications — have been used by industry. With them, and with the new Carboloy MTI Plan, you can reduce your single-point tool stocks up to 30 per cent or more. **SEND COUPON.**

Now you can make excellent savings across the board when you order single-point Standard Carboloy Tools, styles A through G. Effective June 22, 1953, prices have been reduced 15 per cent on all sizes of these famous Carboloy "Standards."

## OTHER PRICE CUTS

Besides the Standard Tool reductions, prices have been adjusted downward on many other Carboloy cemented carbide single-purpose tools and blanks. Reductions range from 5 per cent up to 30 per cent on these items.

Large demand and increased production facilities are responsible for the reductions. The new Carboloy plant at Edmore, Michigan, has recently reached full production on these popular tools. In addition, facilities at the main plant in Detroit have been increased.

## NEW ADDITIONS TO STANDARD LINES

Along with the price cuts, a number of Carboloy items have now been taken off the "special" lists, and are available as standard stock products. These are Solid Square Boring Tools, Rectangular Reamer Blanks, Stone Cutting Blanks and 20 new sizes of Solid Rectangular Strips.

**SEND COUPON FOR FREE "BRIEF-A-LOG", GT-265**—a handy condensed catalog that lists new low prices, specifications, and new Standard Tools and Blanks.

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Company

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## or Released in an Instant



CLUNCH TYPE



INSTRUMENT MOUNTING



SPLINE TYPE



THIN TYPE



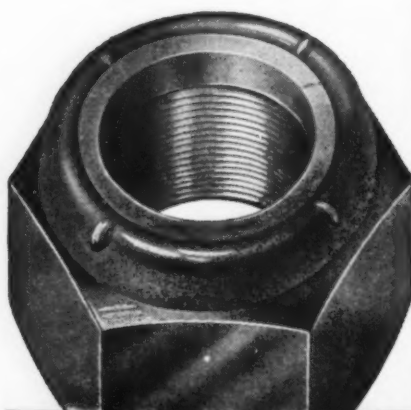
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Faster assembly . . . no more failures of fasteners. GREER STOP NUTS hold firm against jolts, shocks, shimmy, wobbles . . . any vibration, any kind.

Bolt threads are gripped tightly . . . these famous nuts never work loose. Yet an ordinary hand wrench gives instant release. The tough, built-in GREERCOID collar does it . . . and seals against fluid leakage, too!

Study your fastener problem. Over 3000 types and sizes. Consult GREER. Proved on thousands of products. Meets gov't and military specifications.

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# GREER

## Stop Nuts

## Personnel

Continued

F. S. Neal, promoted to manager, Fabricated Sheet Metal Products Sales Div., WHEELING CORRUGATING CO., Wheeling, W. Va.; A. G. Lovejoy, named Boston manager; and E. H. Pace, appointed manager, Mill Products Sales Div.

Bernard Anscher, named sales manager, domestic sales, HYDROPRESS, INC., New York.

George H. Dennison, becomes Buffalo district sales manager, THE CARBORUNDUM CO., Niagara Falls, New York; William G. Kettner, Jr., promoted to office manager, New York sales district.

H. Carl Sandberg, appointed assistant general sales manager, GRISWOLD MFG. CO., Erie, Pa.

Russell R. Clark and Charles F. Persch, become assistant traffic managers, REPUBLIC STEEL CORP., Cleveland; and Charles W. Cravens, named openhearth superintendent.

W. M. Teets, appointed representative, New Jersey area, HANSON-VAN WINKLE-MUNNING CO., and Robert Morriss, becomes representative, New York district.

## OBITUARIES

Amos Bowman, 58, vice-president, Luria Bros. & Co., Inc., in Shadyside Hospital, Pittsburgh, following a brief illness.

R. Leslie Beattie, 62, vice-president and general manager of Canadian operations, The International Nickel Co. of Canada, Ltd., suddenly.

Oscar E. Schlichter, 78, founder, The Hamilton Tool Co., Hamilton, Ohio.

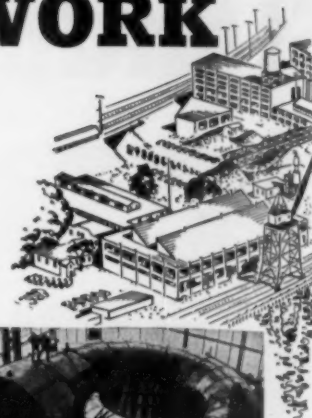
Stephen P. Foster, 65, former economist for Norton Co., recently, in Worcester, Mass.

Harry I. Askew, 62, Detroit district manager, Universal Div., Universal-Cyclops Steel Corp., suddenly.

Jack H. Steckla, 36, general superintendent, Pittsburgh Forgings Co., Jackson plant, suddenly, of a heart attack at his home in Jackson, Mich.

Gail E. Barr, 56, superintendent, Natrona, Pa., plant, Pennsylvania Salt Mfg. Co., after a brief illness.

# STEEL PLATE WORK



## TURBINE CASINGS

and other heavy steel plate work are fabricated at Pusey-Jones of Hot-Rolled, High-Strength, Low-Alloy Steel.

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THE PUSEY AND JONES CORP.  
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Established 1848

# PUSEY JONES

# SINTERED STEEL BUSHINGS

## Extend Life of Roller Chain



By **L. H. Whitney**  
Chief Engineer  
Whitney Chain Co.  
Hartford



**R. Talmage**  
Powder Metallurgy  
Consultant  
New Canaan, Conn

♦ Roller chain with sintered steel bushings is suitable for use where standard roller chain is not or cannot be lubricated properly . . . If used for the recommended horsepower, and where shock loads are not too great, it outlasts standard chain.

♦ Lubrication at the chain joints helps resist corrosion . . . It also absorbs some shock and keeps chain elongation within allowable limits for a longer time.

♦ **SINTERED STEEL BUSHINGS**, tailor-made to lick specific problems of poor lubrication of roller chain, have been developed by the Whitney Chain Co., Hartford. The new bushings, used where lubrication cannot be applied or retained, have lengthened chain life, improved chain efficiency and cut maintenance costs.

Roller chain is like a series of connected journal bearings. Its accuracy, quietness and dependability in service stem from the use of specialized steels, closely controlled manufacturing processes and production skill. And like other mechanical devices, it requires careful installation and proper lubrication for a good and long service life.

Any chain absorbs a certain amount of shock load because of the large number of coupled joints. If joints are properly lubricated, the

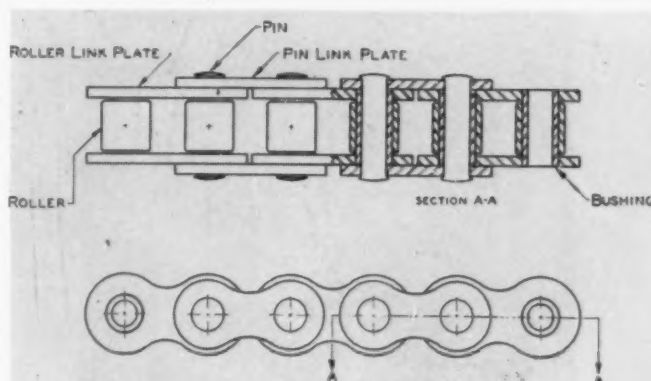


FIG. 1—Sintered steel bushings have many minute interconnecting pores which absorb and retain oil. Their use, under conditions of inadequate lubrication, greatly increases the life of roller chain.



**Bushings contain 12 pct oil by volume . . . Many small oil-filled pores exude oil as temperature rises from friction.**

component parts are separated by a compressible film of lubricant which provides a cushioning effect and contributes to the inherent elasticity of the chain. Under ideal conditions of lubrication, the life of roller chain is usually limited only by the fatigue endurance limit of its components.

There are many applications, however, where adequate lubrication cannot be applied and chain life is shortened by wear. Under such conditions, the chain fails when some part wears thin, or the chain elongates beyond allowable limits. This sometimes occurs in textile and food industries where ample lubrication is avoided to prevent exposure of the product to oil. With some special machines and agricultural implements, unusual operating conditions lead to inadequate lubrication. In some cases, inadequate lubrication limits the use of chain in otherwise suitable applications.

Studies pointed to the use of sintered metal bushings, shown in Fig. 1, as the best solution. Their inherent porosity would provide greater oil retention and capillary attraction to resist oil loss. The bushings would also have a smooth bearing surface with many minute oil pockets.

The big question was whether the fatigue characteristics of commercial sintered metal would take the high impact loads on chain bushings at high chain speeds. Some work had been done on high-strength sintered metal to improve the fatigue characteristics by increasing density, but

by so doing, the inherent porosity and oil retention features of the material were lost. The problem was to get porosity and high strength.

Two tests were started; one to investigate wear life and the other to investigate impact fatigue life. While not necessarily dependent on each other, the combination of satisfactory wear and fatigue life was deemed essential for good chain performance.

The wear tests subjected  $\frac{5}{8}$ -in. pitch (No. 50 American Standard) roller chain to 10 hp in a drive having a 19-tooth driving sprocket and a 45-tooth driven sprocket. The 19-tooth sprocket rotated at 1900 rpm. This is the maximum load recommended by the American Standard chain rating tables for this speed with this size of sprocket. No oil was added during the test which is usually considered complete when the chain has elongated as little as 1 pct.

**Run at twice standard speed**

The impact test subjected  $\frac{5}{8}$ -in. pitch roller chain to 5 hp in a drive with two 12-tooth sprockets rotated at 3300 rpm. This was double the speed recommended by the American Standard chain rating tables for this size sprocket. The chain was lubricated by a continuous oil drip to prevent overheating. This test was considered complete when cracks appeared in the bushing.

The wear curve of standard chain is compared in Fig. 2 with that of a chain with sintered bushings. Total lack of any added lubrication at these speeds accelerated the rates of wear so that

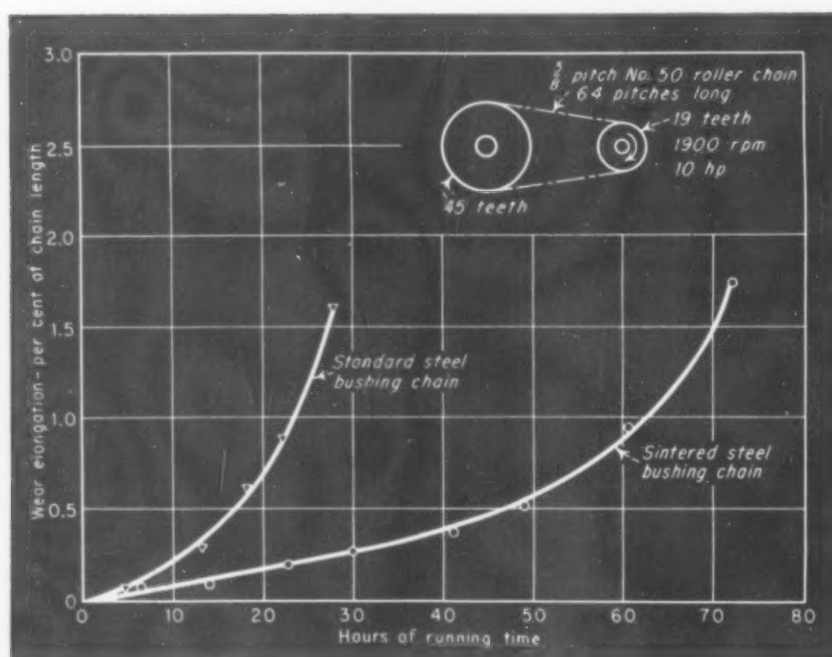
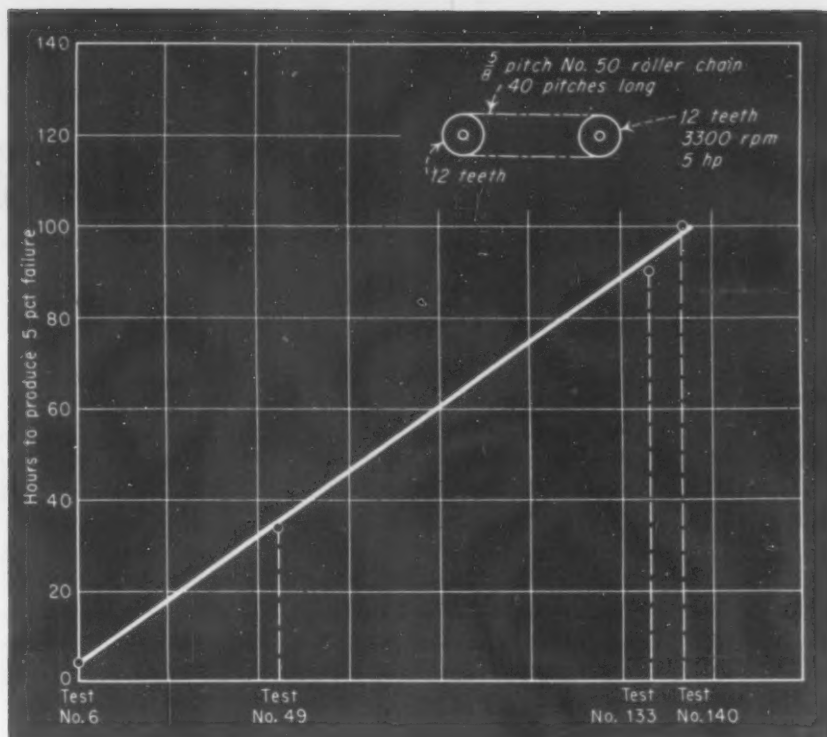


FIG. 2—Without external lubrication, roller chain with sintered steel bushings outlasts standard chain. Retention of oil and high particle hardness have been combined to give good wear resistance.

FIG. 3—Improved resistance to high impact loads now makes sintered steel bushings usable at high chain speeds. Many materials and processes were tested before bushings with longer life were produced.



a quick comparison could be made between the two types.

Improvement in impact resistance of sintered bushings is shown graphically in Fig. 3. Originally, high-quality sintered steel bushings had a tensile strength of about 50,000 psi but were unsatisfactory from a fatigue standpoint. After experimenting with many materials and processes, bushings with much longer life have been produced.

Bushings now have about 12 pct porosity and contain nearly that much oil by volume. The lubricant is contained in many minute interconnecting pores which open to the bearing surface. As friction raises the temperature, the pores exude oil which reduces friction and counteracts further temperature rise. Oil is reabsorbed as the temperature decreases. These factors greatly extend chain life under conditions of inadequate lubrication.

#### Reduce metal to metal contact

A chain pin never makes a complete revolution in its bushing (maximum oscillation is about 30 deg) so that an oil wedge such as produced by rotation of a shaft in a conventional bearing never builds up in the chain bearing. The many small pores in a sintered bushing supply oil throughout the bearing area. To some extent, they fulfill the desirable features of an oil wedge and reduce metal-to-metal contact.

Resistance of sintered bushings to elastic and plastic deformation is less than the resistance of

conventional steel bushings. Yet, particle hardness of sintered bushings is almost equal to that of conventional steel bushings. This yielding in the localized pressure areas reduces bearing pressures while the high particle hardness resists wear.

#### Heat treated in controlled atmosphere

Present sintered bushing materials contain about 5 pct Cu, 0.75 pct C and the balance Fe. Density is about 7 g per cc.

Conventional equipment mixes the ingredients and presses the parts, but techniques have been carefully developed to get the best results. Sintering is done in a controlled atmosphere at 2050°F with a total time cycle of about 2 hr. Heat treating is also done in a controlled atmosphere at 1550°F. This is followed by an oil quench and air draw to proper hardness, then impregnation with special lubricants. Fatigue resistance is developed in the part by a unique treatment now covered by patent application.

Because laboratory tests never exactly simulate all field conditions, a number of field tests were run concurrently with laboratory work. These tests covered a wide range of applications on motorcycles, agricultural implements, can-making machinery, textile machinery, packaging equipment and others. No external lubrication was added during most of these tests. Improved wear life confirmed the benefits obtained in the laboratory tests.

## PRECISION ROLLING



By W. G. Patton  
Asst. Technical Editor

- ◆ Accurately made rolls and ingenious coiling equipment have speeded roll forming of precision parts . . . With special tooling on a standard machine, nickel seals for jet engines are formed at a linear rate of 70 fpm.
- ◆ Diameter of seals is held to within 0.005 in. and other major dimensions to within 0.001 in. . . Split-roll design provides accuracy and economy . . . machine changeover for a different material size takes only a few minutes.

◆ **PRECISION AND SPEED** are the two factors which have given continuous roll forming new importance. Many jobs previously outside the scope of the process are now being done to very exacting specifications. With precision-made rolls and ingenious coiler arrangements, industry is making a wide variety of products at high production rates.

One such instance is that of roll forming high-alloy nickel strip into seals for jet engines. Adoption of the process was prompted primarily because there was no waste of this high-priced material.

### ADVANTAGES OF ROLL FORMING

- ¶ Does away with dimensional limitations of press brake and die forming.
- ¶ No scrap loss due to trimming.
- ¶ No troublesome springback as with some stamped and spun parts.
- ¶ High output with low-cost equipment.
- ¶ High production in small floor space.
- ¶ Machine adjustments are simple and take little time.
- ¶ Minimum power used per unit output.
- ¶ Very thin materials are handled at high speeds.

The machine used for this work, shown in Fig. 1, is a standard machine. All its spindles are driven at the same speed by a common shaft but the position of each spindle is adjustable either upward or downward about 1 in. Tooling was specially designed and built by the Abdite Gauge Co., Dearborn, Mich.

Six sets of rolls form the seals for jet engines from 0.007-in. thick high-alloy nickel strip. These rolls can accommodate strip up to  $\frac{3}{8}$  in. wide and form coils from 4 to 18 in. at a linear rate of 70 fpm. Diameter of the coiled material is held to within 0.005 in. and all major dimensions of the J section formed by the rolls are within a tolerance of 0.001 in.

Carbon steel wire of 0.038 to 0.041-in. diam is also fed into the machine simultaneously with the strip. Take-up rolls, located below the forming rolls flatten the wire and feed it into the machine at a rate equivalent to that of the flat strip. If any variation occurs in the feed rate, the take-up rolls compensate for it.

The first set of forming rolls serves primarily to guide the flat strip. Actual forming begins at the second set of rolls. The degree of deformation depends on the material used, its cross-sectional dimensions and other factors. In this application, only moderate forming takes place at this set of rolls.

The third, fourth and fifth sets of rolls continue to form the J section progressively. A



# Forms Jet Seals at High Speed

device shown in Fig. 2 between the fifth and sixth sets of rolls inserts the flattened wire into the J section of the seal. The sixth set of rolls presses the wire into its final position.

Coil size is determined by tension on the formed strip as it leaves the rolls, design of the coiling device, and the relative position of the coil with respect to the final set of forming rolls. In this application, a single coiler roll forms the diameter of the seals after which the formed material is spiraled onto a rubber-coated shaft. Later, coils are cut to length as shown in Fig. 4, rubber stamped for identification and packed for shipment.

Accurate control of the forming operation is accomplished primarily by maintaining uniform tension on the strip and wire as it passes through the rolls. This prevents the material from skidding on the rolls or sagging between

passes. Some deformation occurs during roll passes but this is overcome by a slight increase in size of each succeeding set of rolls.

The normal step-up in roll size for materials up to 0.010-in. thick is 0.070 to 0.080 in. per pass. It is less for thicker materials in that thickness from 0.010 to 0.020 in. may only require a step-up of 0.030 to 0.040 in.

Split-roll design provides the desired accuracy and makes it possible to replace worn rolls economically. Each part of a split roll is accurately ground to within a few thousandths of an inch of the final dimension just prior to assembly on the machine. Finish grinding and lapping is done after the roll has been assembled to the machine. Splitting is done at the most advantageous location. It may be at the midpoint or where the roll form changes direction. After final gaging for size, rolls are

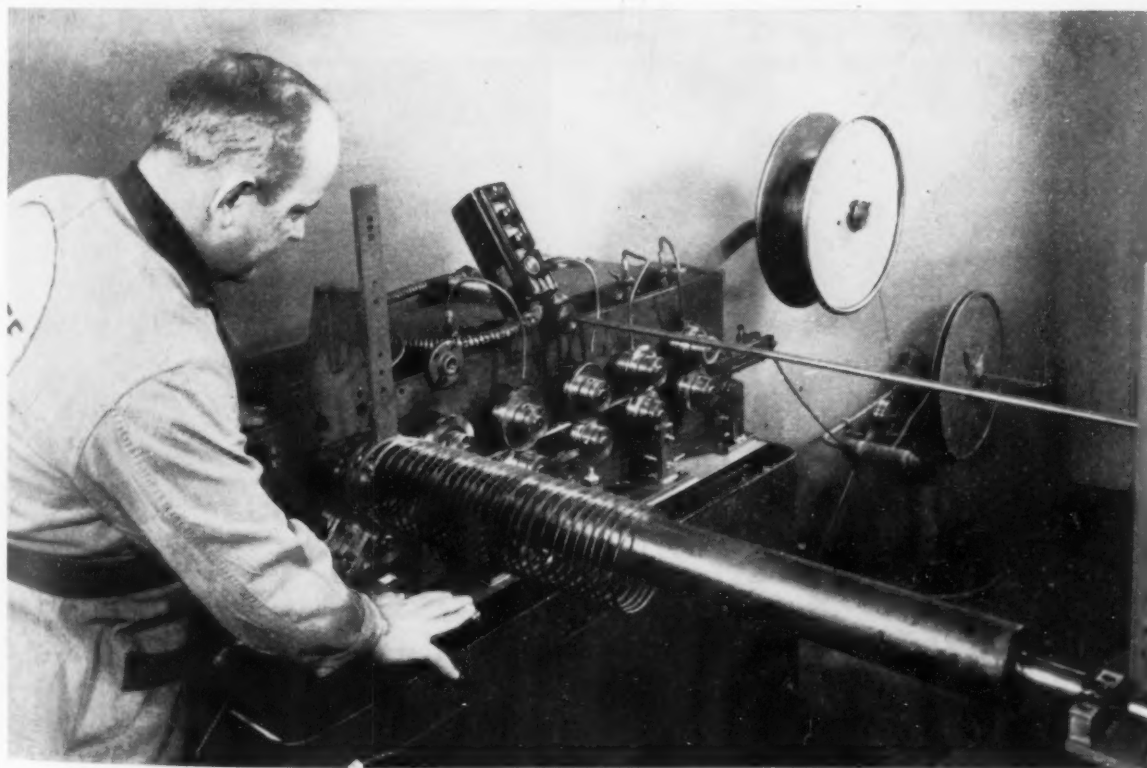


FIG. 1—Labyrinth seals are formed continuously on this standard machine with special tooling. Strip and wire,

fed from the right, come together between the fifth and sixth set of forming rolls.

***Accurate coiling mechanisms  
have extended the usefulness of  
the roll-forming equipment . . .***

checked in detail by shadowgraph projection as may be seen in Fig. 3.

When a split roll becomes worn, it can be taken apart and reconditioned quickly at minimum expense. Very often, only the insertion of a spacer is necessary to return the roll to its original dimension without heat treating or plating.

Several different sizes of material can be roll formed in this machine with only minor adjustments being made in the rolls. Getting the machine ready to handle a different width of material can be accomplished in a few minutes. Most changes in material size require only a minor change such as the insertion of a spacer at the first set of rolls.

When a complete change of rolls is necessary, the top rolls are removed and replaced first.

Use of reliable and accurate coiling mechanisms has greatly extended the usefulness of roll-forming equipment. Besides the single coiling roll used in this application, bender shoes, bull rings and shoes, or combinations of bender rolls may be used.

Roll forming is used successfully to make shroud sections of jet engines. In addition to standard trim and molding, many other items

including automobile head lamp rings, household lamp rings, bicycle rims and window channels are made by this method.

Where the cross-section is uniform and continuous coil or strip material can be used, roll forming offers many advantages over spinning, stamping or press-brake forming. The production rate is high and accuracy is exceptional. Tooling cost is low, particularly if a standard roll-forming machine is already available.



FIG. 3—An operator checks the contour of a roll section in a shadowgraph machine. Dimensions of the roll are held to within a few ten-thousandths of an inch.

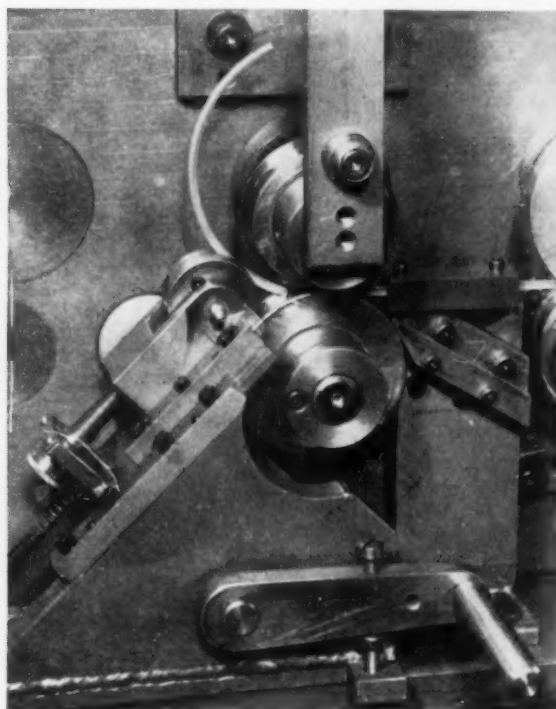


FIG. 2—Uniform tension on the strip as it emerges from the forming rolls helps spiral the material uniformly.

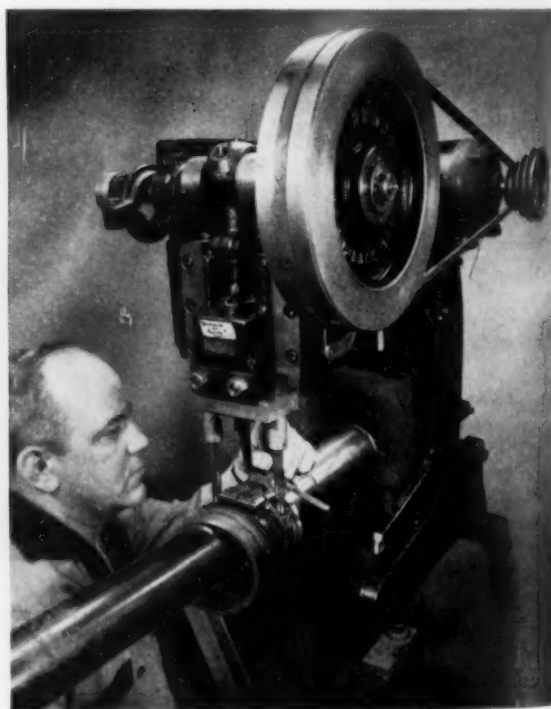


FIG. 4—After forming a labyrinth coil, this machine accurately cuts the spiral into individual seals.

# New Plating Process Expands INDUSTRIAL USE OF GOLD



By E. C. Rinker

Technical Director  
Sel-Rex Precious Metals, Inc.  
Belleville, N. J.

◆ Cost, quality and durability have made gold-plated surfaces entirely practicable for a wide variety of industrial and consumer products . . . Smooth, hard coatings, obtained by a new process, combine wearability with appeal.

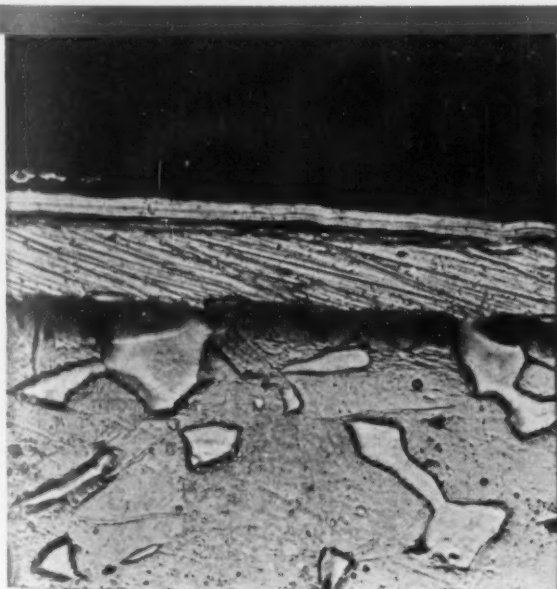
◆ Deposits are bright without brushing or buffing . . . Hardness averages 115 Vickers compared to 65 for conventional gold plate . . . The high-cyanide bath operates at room temperature and cathode efficiency is 100 pct . . . Deposits can be made 0.001 in. and thicker regardless of shape or size of piece being plated.

◆ **FUNCTIONAL COMBINATION** of beauty and serviceability has broadened the entire field of gold plating. With a new process, developed by Sel-Rex Precious Metals, Inc., Belleville, N. J., gold plating of many industrial and consumer products is now entirely practicable from the standpoints of cost, quality and durability.

Prior to World War II, there was little de-

mand for deposition of relatively thick coatings of gold. This was due primarily to the wide use of gold in the jewelry and novelty fields where a thin flash of about 0.000001 to 0.000003 in. was sufficient. Because methods and processes of manufacturers were a carefully guarded secret, production was slow and general technology lacking.

Material shortages, increased demands and



SMOOTH, THICK DEPOSITS do not change contour of the finished surface. Micrograph at 500X shows gold (center layer) following contour without loss of detail.



EVEN AROUND CORNERS, gold plate (center layer) maintains accuracy of contour and uniformity of deposit. Finish suffers no loss of surface detail.



## Lower costs based on improved processes mean wider use of industrial gold plating . . .

recognition of advantages of this noble metal accounted for growing use of gold during World War II. Now, improved techniques have broadened the field for use of gold in practically every branch of industry for both protection and decoration.

Gold plate has many merits as a coating. Its low electrical resistivity, resistance to tarnish, oxidation and attack by salt spray and corrosion make it adaptable to a variety of industrial applications. It also imparts a richness of styling, an important competitive factor with many consumer products.

Use of gold for decorative appeal is perhaps the most significant trend in the field of precious metals plating. Manufacturers have found wide use for gold decoration which not only adds quality and style, but performs a functional purpose as well.

The biggest single factor in the growing industrial use of gold plating is the sharp reduction in cost effected by development of improved methods and processes. At the present time, gold compares very favorably in cost with other electroplated finishes. Its slightly higher cost is more than offset by the many advantages it offers.

Radical changes in production methods are responsible for a large share of the savings. Gold plating has evolved through the pint, quart and gallon stages, and completely outgrown the 4-gal pyrex jar stage. Today, the bulk of gold plating work is processed in 20 to 500-gal tanks, using both still and barrel plating equipment in mass production methods.



DECORATIVE APPEAL combined with protection give these items a finish resistant to corrosion, frequent washing and abrasion from handling and polishing.

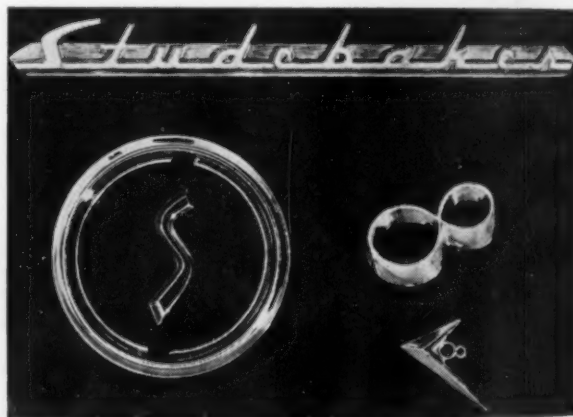
Another important reason for reduced costs is the development of solutions and processes which produce high-quality work. At the same time, they eliminate intermediate operations and drastically reduce rejections.

The latest of significant developments in electroplating is the Bright Gold Process. With this process, costly intermediate scratch brushing and buffing operations are eliminated. Moreover, the deposits have physical characteristics which make it ideal for both industrial and decorative purposes.

Industrial gold plating applications generally require relatively heavy deposits—as much as 0.0001 to 0.005 in. Previously, the only method for plating thick deposits was through the use of a hot cyanide bath. Plated parts, to be densely coated, had to be intermittently scratch brushed or buffed. This operation was costly and deposits were coarse-grained. Specified thicknesses were a hit-and-miss proposition.

The new process eliminates these objectionable features and plates heavy deposits. It completely eliminates scratch brushing or buffing to secure bright, hard, fine-grained, dense and pore-free deposits.

Plating is done from a high-cyanide, low-temperature electrolyte having a gold metal concentration of about one troy ounce of metal



FUNCTIONAL GOLD FINISHES for decorative appointments are finding more use in the automotive industry. The hard, bright finish is corrosion and tarnish-resistant and will withstand weathering and polishing.

per gallon. The solution is mechanically agitated and operates at normal current densities. Cathode efficiency approaches 100 pct. This allows accurate deposition of plate thickness to meet exact specifications. The bath is simple to operate and easy to maintain. While it is a precious metal plating process, production plating is done with conventional equipment.

Hard, bright deposits of 0.001 in. and thicker

are obtained without difficulty regardless of shape or size of the piece. Tukon hardness converted to Vickers scale is 115 as compared to 65 Vickers for conventional gold plating. This hardness is extremely important in the prevention of galling and abrasion. In the electronics field, gold prevents tarnishing, oxidation and corrosion. It also prevents wear on radar and telephonic parts, including sliding and wiping contacts.

Because the bath operates at room temperature, the process is well suited for protective plating of assembled units, soldered assemblies



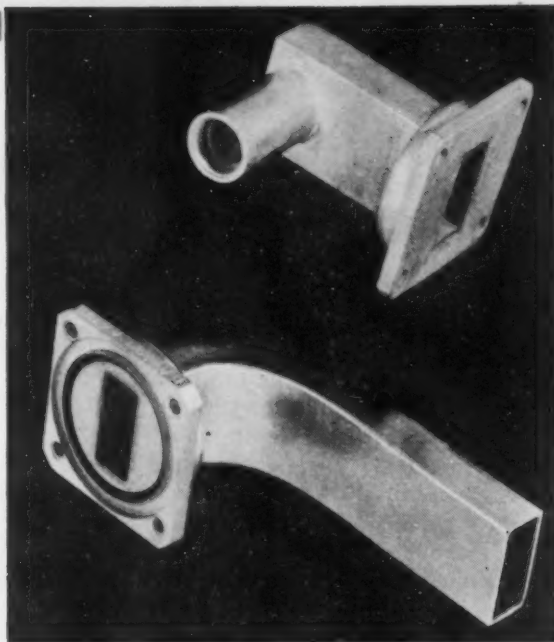
**ELECTRICAL CONTACT SURFACES**, including sliding and wiping contacts, provide good applications for gold. Low electrical resistivity, good protection and extreme hardness give these items long life.

or delicate precision parts where heat might affect strength, shape or characteristics.

Low-temperature operation is also important to the life and efficiency of a gold plating bath. At low temperature, cyanides in the plating bath do not deteriorate and form injurious compounds which cause roughness. Because they do not deteriorate, the bath has long life.

The deposits, considered uniform and fine-grained, open a broad new field of industrial applications for gold. In the decorative field, thin deposits provide unusual protection against corrosion and abrasion of the base metal. They are bright and hard so that they will withstand casual handling, polishing and a wide range of atmospheric conditions.

These properties make it practical to decorate and protect a variety of products which previously could not be gold plated economically. These include entire lines of home appliances, decorative appointments for automobiles, razors, pens and pencils, costume jewelry and novelties, religious articles and sporting equipment.



**GOOD THROWING POWER** of the Bright Gold Process insures uniform distribution of metal on the inside of tubes and cavities without use of an auxiliary anode.

Gold can now be used even when cost is a primary consideration.

Extensive research has been done to determine metal distribution which is important in any plating application. Thickness measurements on various plated objects show accurate determinations have been made regarding distribution of gold.

On metal sheets measuring 2 x 3 in. and plated with an average thickness of 0.0004 in., profilometer readings show variation of only 1.5 to 1 ratio over the entire surface compared to 5 to 1 with conventional gold plating. On other surfaces, similar results in uniformity were achieved. Profilometer tests made on highly buffed surfaces showed no alteration of surface contour even after deposition of 0.001 in. or more of gold.

Uniform distribution makes industrial gold plating applications practicable for protective surfaces where close tolerances are a must. The surface can be plated to a specified thickness without changing surface contour. Where plated thickness must be held to a minimum, even distribution affords uniform protection over the entire surface and eliminates thin spots.

Industrial gold plating has definitely entered a new era in which better quality can be obtained at sharply reduced costs. This applies to protective coatings for many functional parts and for decorative purposes. It combines practicability with beauty for many industrial and commercial products made by mass production methods. On consumer products, the public likes it.

**Black chrome plating**  
**The nickel shortage**  
**Crack-free chromium**  
**Cut cyanide losses**  
**Better gaging methods**

## Plating Convention

◆ REPRESENTATIVES of the booming metal finishing industries gathered in Philadelphia last week at the 40th Annual Convention of the American Electroplaters Society. The 4-day meeting was crowded with technical sessions and seminars covering all phases of metal finishing practice and research.

Number one headache of the platers hasn't changed since the last convention—shortage of nickel. The brand of aspirin currently in use—remelted scrap—is causing as many headaches as it cures. Some of this scrap contains Monel (with, of course, some 33 pct copper). Some platers have been able to get some British, French and Japanese anodes, high quality material but at \$2.35 to \$2.70 per lb.

Feeling in some quarters is that easing in the jet engine programs might ease nickel supply, but wiser heads discount the hope. How to get along on present allocations, supplemented by imports and remelt, was a high priority topic in the convention halls and hotel suites. The consensus was that this would remain a problem for a year to 18 months until new mines come in with a substantial increase in nickel supplies.

Interest centered on bright gold plating (see Page 131), on the new black chromium-base finishes and several papers showing the way to higher plating quality, and closer plating control. Highlights of important convention papers are abstracted here for your convenience.

**Thickness measurements** of plated surfaces have been made with a test setup by the anodic solution method. It is based on the principle of electrolytic solution or stripping of a definite plated area with a known amount of current. Accuracy is  $\pm 5$  pct. C. F. Waite, King-Seely Corp., Ann Arbor, Mich.

**Difference in conductivity** between coating and base metal is the operating principle for a new electronic thickness gage. This method of nondestructive measuring can be applied to a wide variety of coatings such as silver on brass, lead on copper, and many other combinations. J. Garcia-Rivera and A. Brenner, National Bureau of Standards, Washington.

**Tank-hour charges** are helpful in determining chromium plating costs. Variations of this method make it adaptable in meeting many unusual problems involved in applying heavy chrome plate. Where possible, processing of a trial lot is a great help in quoting on a large lot. Technical data marked on the back of a factory order often aids in future cost determinations. W. F. Walton and P. B. Lonsbury, Walton & Lonsbury, Attleboro, Mass.

**Improved resistance** to oxidation at elevated temperatures is possible when molybdenum is properly protected. Cladding, ceramic coating, gas plating and diffusion methods have been used, but each has certain disadvantages. One of the best methods is to plate alternate layers of chrome and nickel on molybdenum, then heat treat at about 2500°F in an inert atmosphere. A. Korbelak, Plating, Newark, N. J.

**Black chromium-base finishes**, having good adhesion and able to withstand heating to 500°C in high vacuum, can be electroplated on most metals with conventional equipment. The finishes contain vanadium and nickel, or both, and consist of finely-divided metals and oxides. Of the three baths that have been used, one produces a silvery deposit which changes to black when treated with hydrochloric acid. Two other baths produce black finishes without subsequent treatment. Baths are operated at 86° to 130°F and current densities range from 75 to 200 amp per sq dm. M. Quaely, Westinghouse Electric Corp., Bloomfield, N. J.

**Physical properties** of electrolytic nickel change as a result of the effects of chro-



# Highlights . . . .

mium as an impurity in the nickel bath. Adhesion, hardness and ductility suffer. Chromium affects covering power and salt spray corrosion resistance. The effects differ with trivalent and hexavalent chromium. D. T. Ewing, J. K. Werner, A. A. Brouwer and C. J. Owen, Michigan State College, East Lansing, Mich.

**Iron plating** from a new alkaline solution is used in production of steel gun parts and other items assembled by brazing. This new solution, using two complexing agents, deposits a flash coating of iron over the entire surface and permits uniform blackening. Throwing power is good but the bath is extremely sensitive to temperature. Efficiency is between 80 and 90 pct at boiling point but drops off sharply to about 13 pct at 130°F. Current densities of 20 to 40 amp per sq ft give optimum results. H. B. Linford, Columbia University, E. F. Foley and W. R. Meyer, Enthone, Inc., New Haven, Conn.

**Crack-free chromium** can now be electro-deposited by a new process using special chromic acid baths. Deposits are dull to semibright, but being softer than ordinary chrome plate, are easily buffed to a high finish. They remained crack-free when heated to 1000°F whereas ordinary chrome cracked at 300°F. In salt spray tests, crack-free deposits plated directly on steel to a thickness of 0.0003 in. showed only a few scattered pin points of rust after 100 hr while ordinary chrome plate failed completely after 24 hr. It also has superior leveling action and withstands higher external stresses. In decorative plating, it promises less intermediate plating. R. Dow and J. E. Stareck, United Chromium, Inc., Detroit.

**Removal of metallic cations** from chromic acid solutions is now done on a commercial scale by a cation exchanger in the hydrogen cycle. It substitutes hydrogen cations and reconstitutes chromic acid from its salts. When the cation exchanger becomes exhausted, it is regenerated by passing a

strong acid solution through it. The process is particularly applicable in anodizing plants and is economically feasible for hard chrome plating. One new cation exchange resin showed no physical or chemical breakdown using 40 pct  $\text{CrO}_3$  solutions. Treatment cost is repaid rapidly by savings in replacement costs of chromic acid. C. F. Paulson, Permutit Co., N. Y.

**Abrasive polishing** does not improve steel surfaces for subsequent plating. Micrographs show that grit acts like a milling cutter and forms fragmented metal particles and slivers which reduce corrosion resistance and smoothness of plated surfaces. In some cases an electro-etch helps to remove metal particles but the best approach is to order a good grade of steel and plate it as is. W. L. Pinner, Houdaille-Hershey Corp., Detroit.

**Chemical decomposition**, along with dragout and spray, accounts for loss of much cyanide from plating solutions. Such chemical losses result from hydrolysis to form hydrogen cyanide, hydrolysis to form ammonia, oxidation to cyanate, reactions with atmospheric carbon dioxide, oxidation to cyanogen, and formation of complex ions. By addition of chemical agents to the bath, losses can be minimized. R. F. Muraca and E. J. Serfass, Lehigh University, and W. R. Meyer, Enthone, Inc., New Haven, Conn.

**Metallographic examination** of killed, semi-killed and rimmed steels encountered by electroplaters' aids in determining the effects of different methods of surface preparation. Tapered sections of polished and etched surfaces studied at various magnifications clearly brings out the structure and characteristics of the steel. A. E. R. Westman, Toronto.

**A better method** of selecting research projects has been developed by the Research Committee of the American Electroplaters Society. The committee's new procedure will seek out opinions from a broad group of highly trained specialists.



## Flush Welds Withstand Impact

By Lt. Carl E. Hartbower  
Chief of Welding Section  
Watertown Arsenal Laboratory  
Watertown, Mass.

♦ Mild steel weldments have a greater tendency to fracture when weld reinforcement remains in place than do those with welds ground flush . . . Explosion tests subjected weldments to balanced biaxial loading over a range of temperatures.

♦ Rise of about 80°F in transition temperature results from presence of reinforcement . . . Removal of reinforcement appears desirable under conditions of severe loading . . . Greater cross-section provided by weld reinforcement does not reduce tendency toward brittle fracture.

♦ CONTRARY TO POPULAR BELIEF that weld reinforcement is beneficial, tests show that welds ground flush have far less tendency to produce brittle fractures. This was determined from weldments subjected to biaxial loading over a range of temperatures, then compared with and without weld reinforcement.

In a semiworks scale structural test of butt-welded joints developed at the Naval Research Laboratory, Washington, bulging of plate up to 1 in. thick as shown in Fig. 1 was accomplished by the force from an explosive charge. The objective for using this method was to provide uniform and controlled loading of the weld, heat-affected zone and parent plate, and to determine the factors which control weldment performance.

This test showed<sup>1</sup> that a system of stress and strain entirely foreign to the remainder of the structure may develop in the weld and near-weld regions. It also showed that at tempera-

tures from -110° to +25°F, the bulge test is primarily an evaluation of the crack initiation stage of failure.<sup>2</sup>

In early tests, weldments were surface ground and the stress system in the bulge was essentially biaxial so that extensive deformation occurred before fracture began. By lowering the testing temperature, significant data of structures operating at elastic loads were obtained by causing fracture to occur at near-zero levels of deformation. Resistance to flow was introduced by the lower temperature resulting in a condition of severe triaxiality or high stress rate.

Use of low temperature to initiate brittle failure in tough welds caused the base plate to fracture extensively because of its low resistance to crack propagation. Crack initiation at near-zero level of strain occurred at widely different temperatures, depending on the notch toughness of the weld. Because of this, tem-



Fig. 1 — Explosive charge bulged this 3/4-in. thick plate. In testing weldment performance it provides uniform and controlled loading of entire weldment.

# BETTER THAN REINFORCED WELDS

perature served as a measure of performance—the lower the temperature to initiate fracture, the better the performance rating.

These studies were the first step toward a better understanding of the performance of weldments over a wide temperature range and under combined load. To avoid the complication of weld reinforcement, plate and reinforcement were machined to a uniform thickness of 0.650 in. This eliminated the possibility of variations in (1) as-rolled plate thickness, (2) porosity near the surface of weld reinforcement and dendritic structure of the last weld pass, (3) geometrical features of weld reinforcement, and (4) restraint introduced by the added cross-section of the weld reinforcement.

The purpose of this test was to determine the effect of weld reinforcement in altering the temperature at which transition occurs from ductile to brittle behavior in butt-welded joints. The material used was  $\frac{3}{4}$ -in. thick fully-killed mild steel plate made to ASTM Specification A201-49, Grade B. It had a chemical analysis of 0.14 pct C, 0.60 pct Mn, 0.21 pct Si, 0.019 pct P, 0.036 pct S and 0.27 pct Cu.

Two weld metals, AWS Type E6010 and E12016, were tested. The welds, made in a 60°, double-V joint, were radiographed, and flaws recorded for possible correlation with fracture performance. By radiographic examination, porosity was found in the as-deposited E12016 welds. Because much of the porosity was near the weld surface, machining of the weld reinforcement and 0.05 in. of base metal removed much of it.

Flow strength of the base metal was 73,000 psi. This was overmatched by the E6010 weld metal which had a flow strength of 84,000 psi. The E12016 deposit was a decided overmatch with flow strength at 133,000 psi.

Strain concentrations in the transweld direction, and the restraining effect of a high-strength weld deposit, weld reinforcement and plate thicknesses are shown in Fig. 2.

To determine V-notch Charpy impact transitions, weld specimens were cut transverse to the joint and as close to the surface as possible so that the apex of the notch would be in the

last weld pass. Plate specimens were cut longitudinal to the direction of rolling with the notch perpendicular to the surface. At 15 ft-lb, transition temperatures were 0°F for the base metal, -50°F for the E6010 weld metal and -100°F for the E12016 weld metal.

Measurement of biaxial strains in the bulge surface and reduction of bulge thickness by means of a photogrid on the bulge surface provide data for evaluation of distribution of plastic deformation in weldments. Having established that strain gradients occur in the transweld direction, thickness strain by micrometer caliper is the more expeditious measurement.

In evaluating fracture performance by mea-

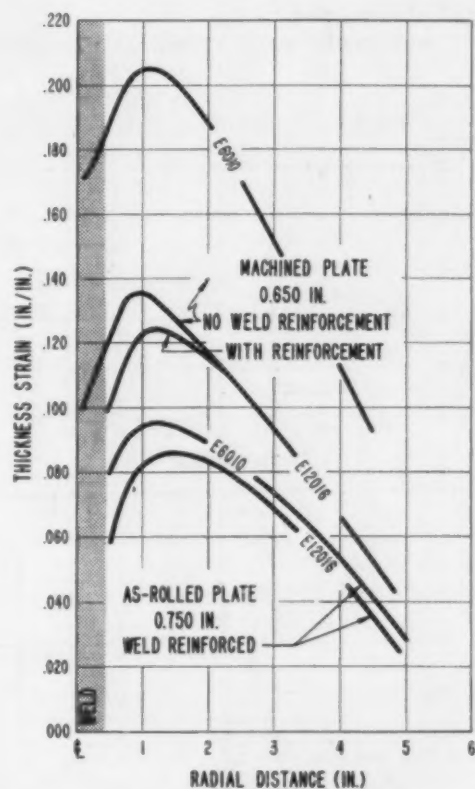


Fig. 2—Transweld strain distributions show effects of high-strength weld deposit, weld reinforcement and plate thickness in restraining plastic flow.



**Separation often started at the base of a higher-than-average ripple where electrodes changed.**

surement of thickness strain, the place of first separation and the general level of strain accepted by the weldment as a whole up to the time of fracture are of greatest interest. However, in the case of a weld of flow strength less than that of the base metal, measurement of thickness strain at the site of first separation will indicate high ductility because of strain concentration which occurs in undermatching welds. Strain of the entire weldment may be relatively low.

For a true evaluation of overall performance, strain measurements were made  $1\frac{1}{2}$  in. from the weld center on a radial line through the pole of the bulge. This is beyond the drastic strain gradients which occur in the weld and near-weld region as from mismatching flow strengths.

In plotting transition curves, 10 pct strain (0.100 in. per in. reduction in thickness) was arbitrarily taken as a limiting value. If a bulge fractured at a strain in excess of 10 pct, it was considered to have behaved in a ductile manner. In plotting strain-to-fracture versus temperature, data were represented as a circle at the 10-pct strain level.

As weldments were bulged at successively

lower temperatures, a transition range was reached where most fractures occurred between 10 and 1 pct strain. At still lower temperatures, fractures occurred at strains of 1 pct or less. Strain of 1 pct was taken to indicate completely brittle performance.

Previously, E6010-MS weldments, finish-machined and surface-ground to a thickness of 0.650 in., had a transition range of  $-90^{\circ}$  to  $-50^{\circ}\text{F}$ . Failures started in the weld deposit and occurred in the transweld direction. With the full plate thickness of 0.750 in. and the weld reinforcement intact, the transition range shifted upwards considerably as shown in Fig. 3 to a marked degree. The lower limit of the transition range was raised about  $65^{\circ}\text{F}$  and the upper limit more than  $125^{\circ}\text{F}$ .

All fractures as may be seen in Fig. 5, started in the weld metal in the transweld direction. Moreover, the site of first separation usually occurred at the base of a higher-than-average ripple where the welder changed electrodes. Variation in fracture appearance corresponding to the top-pass weld metal was clearly delineated.

The E12016-MS weldments, finish-machined and surface-ground to 0.650 in. produced a narrow transition range at approximately  $-110^{\circ}\text{F}$ . For practical purposes, this coincided with the transition of the finish-machined prime plate. In the as-welded condition with weld reinforcement on, the transition was shifted upwards as shown in Fig. 4, to the range of  $-50^{\circ}$  to  $0^{\circ}\text{F}$ .

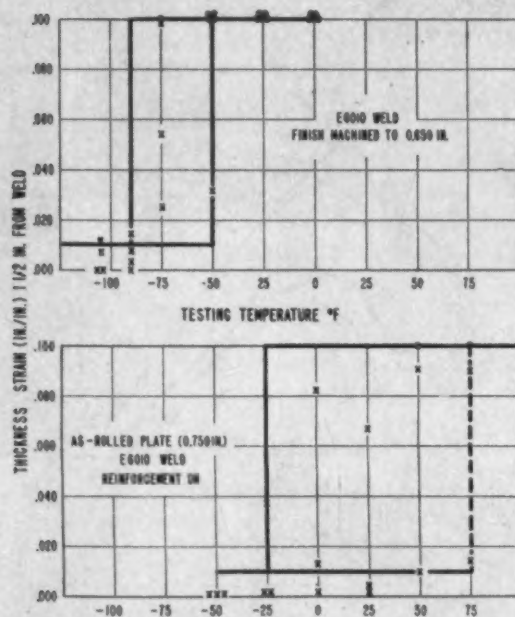


Fig. 3—Explosion bulge transitions of E6010 mild steel weldments show comparison between finish-machined and as-welded conditions. It demonstrates the detrimental effect of weld reinforcement.

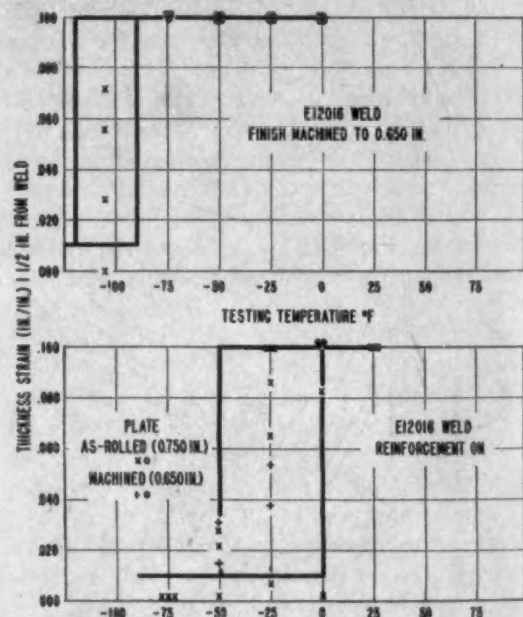


Fig. 4—Explosion bulge transitions of E12016 mild steel weldments show how finish-machined, finish-machined with weld reinforcement and as-rolled with weld reinforcement weldments compare.



Fig. 5—Fracture pattern of a typical E6010 weldment shows origin of fracture to be in coarse top-pass weld metal at a higher-than-average ripple. (Left)

Fig. 6 — Base metal fracture in E12016 weldment with high-strength weld is typical of five out of eight failures which originated in the base metal.



However, five of the eight fractures started in the base metal as may be seen in Fig. 6. Thus, in the case of the E12016 deposit, weld reinforcement was not solely responsible for the shift in transition temperature.

Base metal failures may have resulted from the greater thickness of the as-rolled plate, or some mechanical or metallurgical condition existing at the plate surface. There was insufficient material to determine the transition for the as-rolled unwelded plate. For additional information on the effect of weld reinforcement, a few plates were finish-machined to 0.650 in. and then welded. By testing finish-machined plate with the weld reinforcement on, variables of plate thickness and as-rolled surface were eliminated. The transition, for practical purposes, was the same as for weld-reinforced as-rolled plate. And, base metal failures persisted.

The as-rolled surface and the greater thickness of plate appear to have had little or nothing to do with the marked rise in transition temperature. However, base-metal failures occurred at temperatures of  $-50^{\circ}$  to  $0^{\circ}$ F in weld-reinforced finish-machined plate whereas transitions for finish-machined prime plate and finish-machined E12016-MS weldments were previously established at about  $-110^{\circ}$ F.

Based on these data, it must be concluded that as a result of the greater restraint introduced by the increased cross-section of high-strength weld metal, weld reinforcement caused base-metal failures and the attending shift in transition.

Contrary to general belief that weld reinforcement is beneficial by virtue of the greater cross-section provided, the transition from ductile to brittle behavior in reinforced welds occurs at appreciably higher temperatures than in finish-machined weldments. If attention is focused on the lower level of the transition range where the temperature at which little or no ductility remains, a difference of more than

$60^{\circ}$ F exists between finish-machined and reinforced weldments. At the upper level of the transition range, there is a difference of approximately  $100^{\circ}$ F. These differences held for both E6010-MS and E12016-MS weldments.

A comparison between the performance of E6010 and E12016 welds with reinforcement showed the E12016 to be superior. Temperatures corresponding to the upper and lower sides of the transition range for E6010 were higher by  $75^{\circ}$  and  $25^{\circ}$ F respectively. Marked superiority of the E12016 deposit at the upper transition is attributed to higher strength in restraining plastic flow in the transweld direction.

Flow strength and notch toughness of the weld deposit appear to be controlling factors in the performance of pearlitic steel weldments. Behavior of E6010 welds with reinforcement intact confirms the need for a premium in notch toughness, particularly in the presence of the notch-like ripples of weld reinforcement.

Many of the E12016 failures which started in the base metal were unexpected because strain-deconcentration effect in the weld region should have alleviated the detrimental effect of the weld toe. A notch-sensitive heat-affected zone provides a possible explanation for the base-metal failures in the weld zone. Also, the severe strain gradients which occur when the flow strengths of weld and base-metal are not matched may have been a contributing factor.

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- <sup>2</sup> C. E. Hartbower and W. S. Pellini, "Investigation of Factors Which Determine the Performance of Weldments," *Welding Journal*, Oct., 1951.

#### ACKNOWLEDGMENTS

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## Butt-Brazed Carbide Tips IMPROVE TOOL LIFE



By Walter Jellig

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Ford Instrument Co.  
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- ♦ In machining wells around posts of planetary carriers for helicopter transmissions considerable difficulty was encountered . . . Cutters with carbide tips brazed to front faces of the shanks gave poor performance.
- ♦ Butt-brazing the tips to the top of the tool shank improved tool life over 200 pct . . . Shank deflection was decreased . . . The design reduces brazing strains.

♦ **INCREASED TOOL LIFE** through the use of butt-brazed carbide tipped cutters has been achieved by Ford Instrument Co. on many machining operations. The butt brazing method developed is quite effective in reducing tool wear because of the increased rigidity of the tool shank which permits it to take advantage of its full cross-sectional area. The effect of shank deflection on the carbide tips is reduced and the design permits greater freedom from brazing strains.

An increase in tool life of over 200 pct was obtained on one difficult machining operation after butt-brazed carbide tips were used. In this operation wells had to be machined around the posts of planetary carriers for helicopter transmissions, Fig. 1. The pieces are forgings, SAE 4340, rough turned and heat treated to Rc 32 to 36. Finishes of 125 rms are required. Tolerances on post locations are  $\pm 0.0005$  in., and on the grinding of post diameters  $+0.0003$  in. to  $-0.0002$  in.

The first machining operation required milling two slots to a depth 0.010 in. short of finished dimension, A in Fig. 1. In this way, a chamfer was provided at the edge of the well, material was removed before hollow milling, and the chip problem was reduced for subsequent operations. The second operation, B in Fig. 1, called for mounting the part in an indexing fixture and hollow milling the planet posts.

This machining operation blended with the milling cuts. The last operation, C was a second hollow milling. The outer periphery of the well and the bottom were finish-milled to size.

At first the cutters had the carbide tips brazed to the front faces of the serrated shanks in the conventional manner, Fig. 2A. The cutters were then mounted in a Cincinnati vertical miller augmented by a flywheel. With this setup it was possible to machine only 8 to 20 planet posts before the cutters broke down. When they were removed from the machine the carbide tips were found to be mutilated beyond repair. After much investigation, it was decided to butt-braze the carbide tips to the cutters in the manner shown in Fig. 2B.

A commercially available serrated shank was milled to receive the carbide blank. A step  $1/32 \times 1/16$  in., Fig. 2B, was left to act as a positioner for the carbide blank, and to prevent the silver solder from running into the serrations. Then the shank was cleaned with a wire brush and clamped in a vise back to back with a dummy shank. Flux was applied to the shank where the blank was to be seated, and to the carbide tip which had been cleaned by a dry Crystolon wheel.

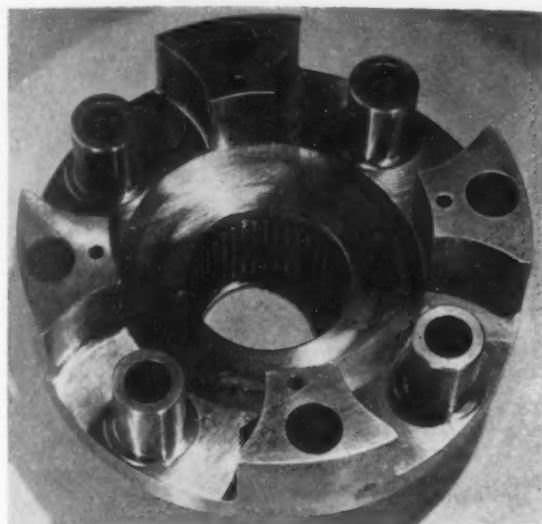
At this stage great care was taken to prevent contamination of the prepared surfaces since even the contact of a finger would ruin the braze. A 0.010-in. nickel shim, coated on each



## Improved methods of brazing carbide blanks and mounting shanks in holders were developed . . . CO<sub>2</sub> coolant increased tool life.

side with about 0.005 in. of silver solder, was positioned on the shank seat. The carbide blank was placed on the shim. An oxyacetylene torch played on the "sandwich" while the operator puddled and applied pressure to the top of the carbide blank with a steel rod. Brazing in this manner almost completely eliminated the hair crack.

Next, the shank had to be mounted in the holder. Pressing the shank into the holder by means of an arbor press was unsatisfactory. Instead the shank was hammered into place by a 1.5-lb ball-peen hammer, utilizing a piece of linen bakelite to protect the carbide. Blanks were never cracked by this method, perhaps because of the shock resistant characteristics of the grade specified, 78B or its equivalent.



The diameter of the cutter body expanded as the shanks were driven into place. The extent of this expansion was determined by taking a few experimental cuts and allowing the shanks to set home. This dimension was stamped on the cutter body, and all future bits were set home by measuring the diameter. In this way movement of the cutter back into the body during the cutting operation was prevented. Shims were used in front of the serrated shank when necessary to set the relationship between cutting edges.

After assembly the cutter was finish-ground in a Cincinnati cutter grinder. Slots are provided immediately under the cutting edge for indexing in this operation, Fig. 3. After the grinding operation the cutting edge of the carbide bit was broken 0.002 in. to 0.003 in. by a stone, and the cutter was ready for use.

At present the cutter is being run at 385 rpm with a spindle feed of 0.0068 ipr. It produces an average of 45 posts per sharpening, Fig. 4. The shop record for one grind is 164 posts, that is, 41 complete components. The tool cutting with its outer periphery is run with CO<sub>2</sub> coolant. This has increased tool life over liquid coolants about 25 pct and has improved the surface finish in many cases to a point where it is considerably better than that required. The tool cutting with its inner blades is cooled by soluble oil running through a slip ring.

The design described has been successfully applied by Ford Instrument Co. to many other types of tools. It was quite valuable in one lathe application where the carbide tools were breaking down because chips were undermining the shank directly beneath the carbide, Fig. 5.

Turn Page

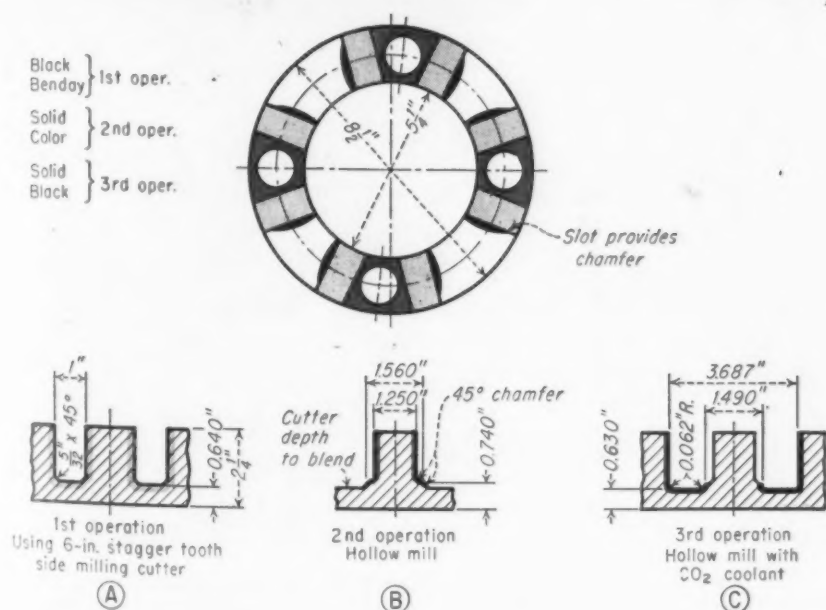
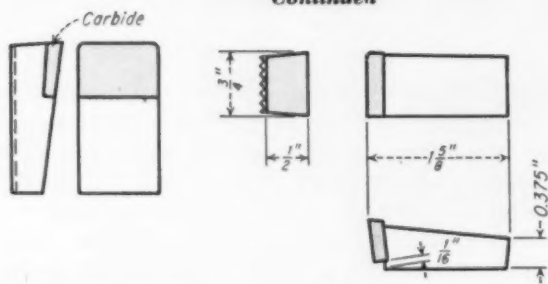


FIG. 1—Wells to be machined around posts of planetary carriers for helicopter transmission presented tool life problems until butt-brazed tips were used. Photo, above left, shows the carrier. Drawing, left, shows sequence of the three milling operations required for machining the wells of the planet carrier.

## Butt-Brazed Carbide Tips

Continued



(A) Conventional brazing

(B) Butt-brazing

FIG. 2—Conventional cutters formerly used, A, had carbide tips brazed to the front of the tool shank. Cutters now used, B, have tips butt-brazed to shank.

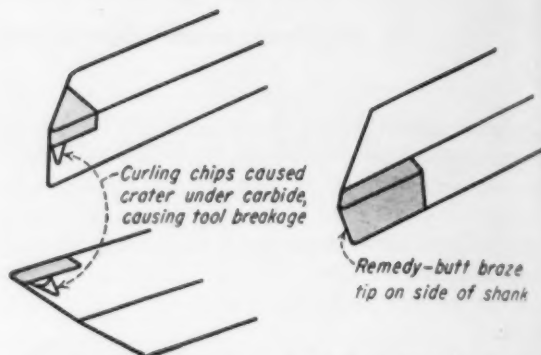


FIG. 5—Butt-brazing a carbide tip on the side of the shank enabled the carbide to act as a wear plate as well as a turning tool in lathe application.

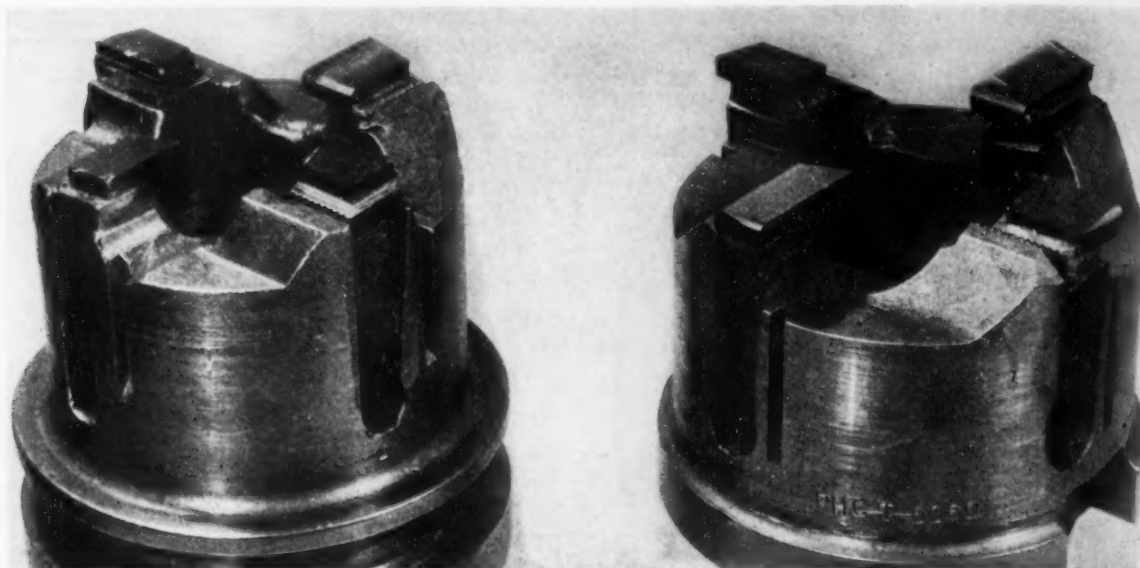


FIG. 3—The cutter, left, is ready for resharpener after machining 92 planet posts. Compare this with duplicate

cutter, right, ready to go into the machine. Shop record for one grind is 164 posts.

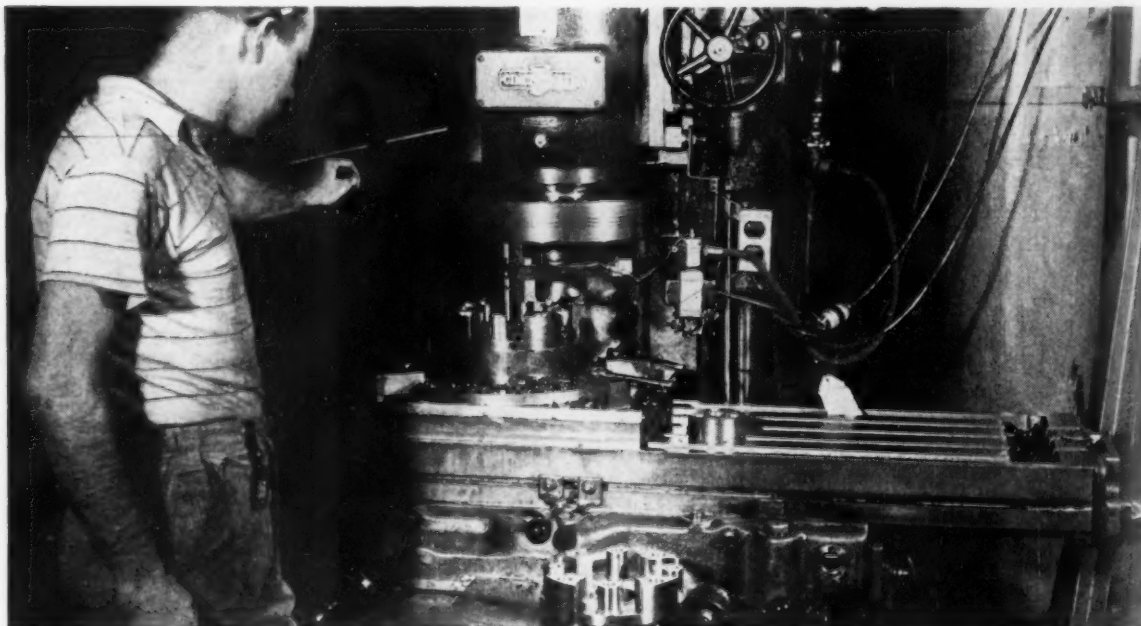


FIG. 4—Planetary carrier mounted in index fixture for hollow milling operation on flywheel-equipped Cincinnati

vertical milling machine. After grinding cutting edge of bit was stoned slightly.

# You Can Get Better, Lower Cost Processing of Stainless Steel — These Three Ways:

## HEAT TREATING

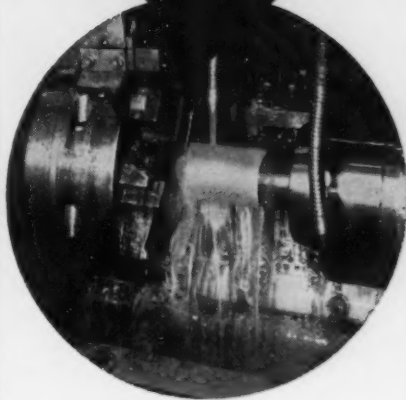


*You get more precise heat treating with Houghton Liquid Heats.*

Our salt baths devised for stainless steel treatment will preserve the surface. They eliminate danger of inter-granular corrosion, oxidation or other attacks. Heating of parts is uniform and fast.

Houghton salts are carefully compounded to meet predetermined specifications and to remain stable.

## MACHINING

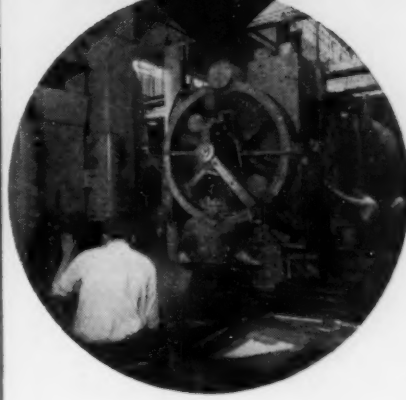


*Your machines can turn out better parts, faster, with Houghton Cutting Fluids.*

Including highly fortified straight cutting oils for slow speeds, and concentrated bases, both oil- and water-soluble types.

Special emphasis is laid on Antisep All-Purpose Base, used in water emulsions and fortified to provide the lubricity, film strength and anti-welding properties required for machining stainless.

## FORMING



*Houghton Houghto-Draws assure better finished formed parts, longer die life.*

Whether your draws are deep or shallow, simple or complex, there is a Houghto-Draw compound ideally suited to your job. It will provide the film strength and controlled lubricity required for the simplest or toughest drawing job.

Applied by brush, spray or dip, according to your requirements.

For more economical, uniform and productive fabrication of stainless, be sure to take advantage of the metalworking know-how and processing products of Houghton. Call the Houghton Man, or write us, outlining your problem. We'll be glad to help. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

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Ready to give you  
on-the-job service ...



DO REJECTS  
SLOW UP YOUR  
PRODUCTION LINE?

OAKITE PAINT STRIPPERS  
MAY HELP YOU BREAK  
THE BOTTLENECK

When painting rejects slow production, you may need one of the stripping methods described in "How to STRIP PAINT," a free booklet which answers many questions about effective stripping procedures. For example:

What is the cheapest way to strip metal parts in large volume?  
*See page 9.*

What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-base paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

**FREE** For a copy of "How to STRIP PAINT" just send us the coupon.

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Send me a FREE copy of "How to STRIP PAINT." Also, tell me about your methods for removing the following organic finishes:

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

## TOOLMAKING:

Scale removal by wet blasting cuts tool polishing costs.

Manual polishing operations involved in the removal of heat treat scale from parts for metal-cutting dies can be eliminated by wet blasting, die makers have found.

Sizable reductions in hand polishing for dimensioning of parts after scale removal result from close abrasion control which permits closer machining and grinding of the work prior to hardening.

### Save 15 Hr Work

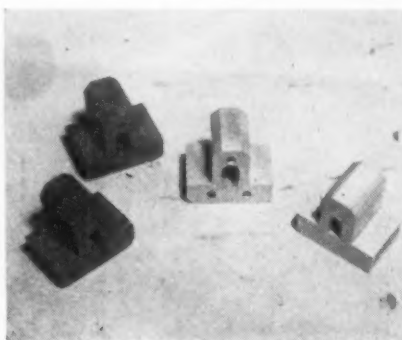
On a recent job consisting of 17 identical die inserts for a metal-cutting die, Unified Tool Die & Mfg. Co., Chicago, cut surfacing time after heat treating over 5 hr by this process of scale removal.

The die inserts are 1 x 1½ x 1½ in. high. Cleaning of punch inserts was reduced 10 hr. These 15 hr represented an 80 pct polishing time saving.

Both heat treating and wet blasting of parts are done at Perfection Tool & Metal Heat Treating Co., Chicago. Cleaning time for the die inserts in a Liquamette machine, made by American Wheelabrator & Equipment Corp., Mishawaka, Ind., was less than 5 min per part. Cleaning medium was 325 NE Liquablast.

### Uses Air Pressure

During the operation, the operator stands outside the machine with his arms through gauntlets and



INSERTS for a metal cutting die made by Unified Tool Die & Mfg. Co. of Chicago. Two inserts, left, show scale-covered condition after hardening. Inserts, right, show parts which have been wet-blasted.

## IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 87. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

manipulates work in front of the abrasive gun inside. The abrasive is mechanically suspended in water by means of agitation furnished by a vertical centrifugal pump. The abrasive slurry is propelled at the work by 80 to 100 psi of compressed air.

The entire surface of each piece is finally dimensioned from the center hole. Prior to use of wet blasting, the die maker polished the scale off the surfaces to get to bare metal for final dimensioning, because grinding sometimes produced surface cracks on hardened materials. Surface cracks do not occur with wet blasting.

### Tolerances Maintained

The die maker was able to dimension the hole to exactly the correct size before heat treating, since with wet blasting it is possible to maintain tolerances within 0.0001 in. where necessary, and sharp lines, corners, etc., on work remain undamaged and unaltered.

## SHELL MOLDING:

Cheap sand may boost resin needs expert points out.

A cheap sand is not always an inexpensive shell molding sand, M. F. Drumm of Monsanto Chemical Co.'s Plastics Div. recently told the 57th annual meeting of the American Foundrymen's Society at Chicago.

Admitting that cost and availability are important factors in selecting a sand for shell molding, Mr. Drumm pointed out there are other equally important considerations. Among them he listed par-

## and Production Ideas

ticle distribution, grain shape and condition of the sand surface.

### Weigh Costs Carefully

Use of cheap sand often makes necessary the use of extra large amounts of resin to produce suitable shells. Since the resin content of each shell is more costly than its sand content, use of cheap sand in the long run may mean more costly shell production.

The importance of choosing the proper resin for each job was emphasized. Monsanto has developed a variety of resin formulations to produce the most efficient resin-sand mixes.

### Test Procedures Recommended

Studies are now underway, Drumm said, to find new ways of cutting down on the amount of resin necessary to produce satisfactory shells. He said that in the future more efficient utilization of resin may be achieved by one or more of the following methods:

1. Thermal coating of sand with thermosetting binders.
2. Use of alcoholic solutions of conventional binders.
3. Use of liquid phenolic resins for sand coatings.

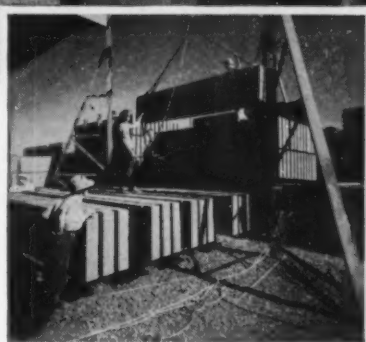
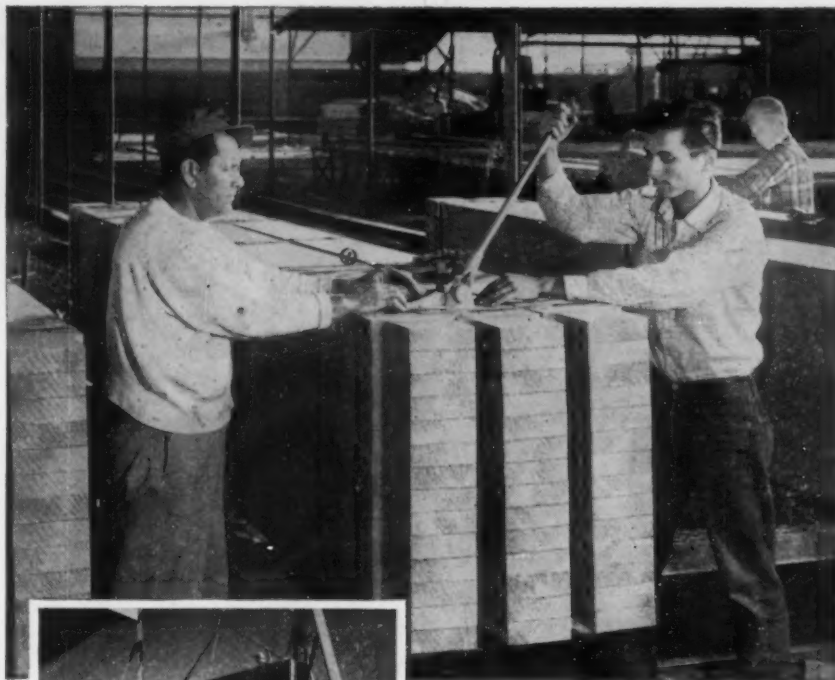
Drumm outlined several test procedures his company recommends for evaluating resin-sand mixes. Of these, he described the flexural and tensile tests as most useful.

Once the strength properties of a mix are verified by these two tests, Drumm suggested additional testing for shell thickness, peeling, hot rigidity and packing on vertical surfaces. If the mix successfully weathers these tests, Drumm said that production on a limited scale may proceed with reasonable confidence.

### Moisten Sweatbands First

Cellulose sponge sweatbands should be moistened and squeezed dry before wearing for best results, according to American Optical Co. The sponges absorb better and are more comfortable when first moistened.

Turn to Page 147



"Packaged" bridges are rolled on conveyor to loading platform, then quickly hoisted aboard flatcars. Photos at Smith Pipe and Steel Company, Phoenix, Arizona.

## PACKAGING A BRIDGE

## Brainard Strapping Service speeds handling of defense materials

These prefabricated Bailey Bridges, used by the armed forces to cross rivers, culverts, etc., are now securely packaged into unit loads with the Brainard Strapping System. This method permits fast mechanized handling of the product from manufacture to shipment.

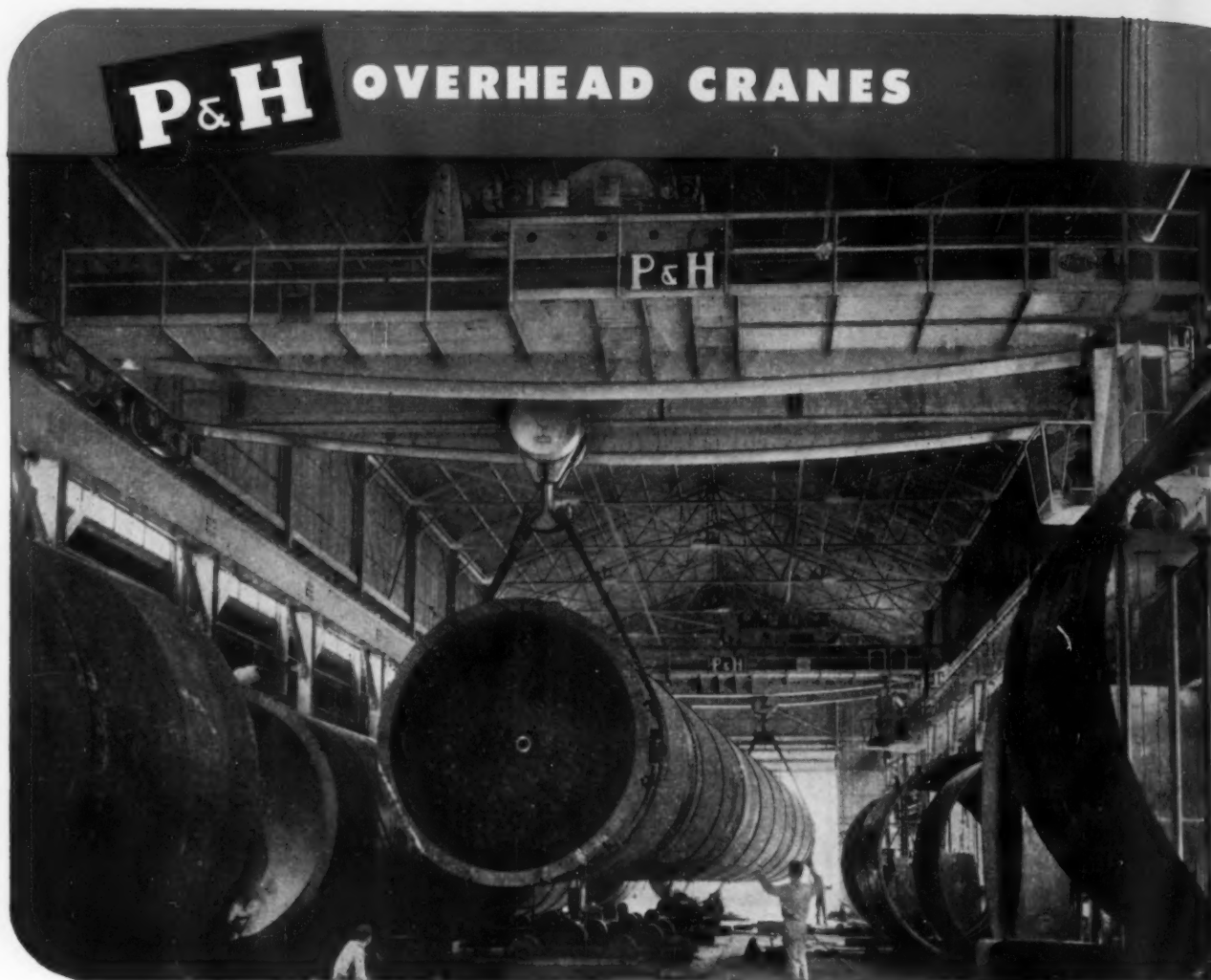
Equally important, the shipments are secured against loss, damage or pilferage until opened for use in the field.

Brainard can help you streamline your materials handling, and meet armed forces shipping specifications. Have an analysis of your handling and shipping operations now—Brainard salesmen are qualified to *recommend and demonstrate* the most efficient system for you.

For complete information call the nearest Brainard Steel sales office, or write Brainard Steel Division, Sharon Steel Corp., Dept. O-6, Griswold Street, Warren, Ohio. In Canada: Brainard Steel Canadian Division, Toronto.



## STEEL STRAPPING



## Why P&H builds the entire Crane ... including electrical equipment!

If you want the utmost in service from your cranes, insist that they be job *engineered* by P&H — not an assembly of components from various sources. For example, general purpose electric motors don't stand the gaff of crane service like those *designed* for the job. That's why P&H builds its own motors, brakes and controls — with all characteristics *properly suited* to crane operation: P&H electrical equipment throughout is your assurance that

all functions are perfectly coordinated. It means better service, less maintenance.

This policy of complete quality control — of single manufacturing responsibility — better service — made P&H the leading builder of overhead traveling cranes. Continuous improvement, far ahead of the field, has extended this leadership. Benefit by it when you buy your next cranes.

\*T.M. of Harnischfeger Corporation for electromagnetic type brake.

**P&H OVERHEAD CRANE DIVISION**  
**HARNISCHFEGGER CORPORATION**

Milwaukee 46, Wisconsin



**P&H MAGNETORQUE®**  
AC Crane Control  
is the most important  
development in crane  
service in 25 years.





## RUBBER:

Resistance to many commonly used chemicals compared.

Many manufacturers find a place for rubber either in the product they make or at some point in the fabrication of that product. Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, recently came up with a handy table which compares the chemical resistance of various types of rubber.

## FOUNDRY:

Design improvements incorporated in large shakeouts.

Lower foundry maintenance costs will result from design improvements recently incorporated in foundry shakeouts.

Two-bearing construction, cushioned vibratory action and a specially designed pivoted motor base to maintain proper V-Belt tension, have been included by Allis-Chalmers Mfg. Co., Milwaukee, in its Foundromatic shakeouts.

The improved shakeout's bearings have only one dust seal as compared with two to five such seals for older designs. The bearings are evenly loaded and shaft stresses are very low.

Steel coil springs with low maximum stress and sufficient deflection to provide over 92 pct absorption of vibration support the shakeout body, mechanism and deck.



WORLD'S LARGEST is the claim Electric Controller & Mfg. Co., Cleveland, makes for this big, all-welded scrap handling magnet. It's 80 in. in diam and useful in handling light weight scrap.

## Chemical Resistance of Rubber

	Buna N	Buna S	Natural	Neoprene	Butyl
<b>ORGANIC CHEMICALS</b>					
Gasoline	A	X	X	A	X
Kerosene, Fuel, Diesel Oils	A	X	X	A	X
Lubricating Oils	A	C	C	A	X
Benzol	X	X	X	X	X
Toluene	C	X	X	C	X
Petroleum Ether, Naphtha	A	X	A	X	X
Hydraulic Oils	A	C	C	F	X
Lubricating Greases	A	C	C	A	X
Butane	A	X	X	F	X

<b>ORGANIC CHEMICALS</b>					
Amyl Alcohol	A	A	A	A	A
Butyl Alcohol (butane)	A	A	A	A	A
Methyl Alcohol	A	A	A	A	A
Ethylene Glycol	A	A	A	A	A
Acetone	X	A	F	C	A
Lacquer Thinner (Acetates)	X	C	F	X	F
Carbon Tetrachloride	X	X	X	X	X
Chloroform	X	X	X	X	X
Dibenzyl Ether	C	C	C	C	C
Freon 22	F	X	X	X	

<b>ACIDS:</b>					
Acetic Acid	F	C	C	F	F
Boric Acid	A	A	A	A	A
Carbonic Acid					
Hydrobromic Acid	C	A	A	A	A
Hydrochloric Acid	A	F	A	F	A
Conc. 150° F					
Hydrocyanic Acid	F	F		F	
Hydrofluoric Acid	X	C	C	A	F
60 pct—160° F					
Phosphoric Acid	X*	X*	F	X*	F
Sulphuric Acid:					
50 pct Cold	F	F	F	F	F
70 pct—120° F	C	C	C	F	F
Nitric Acid:					
5 pct Room Temp.	X	F	X	X	A
40 pct, 120° F	X	X	X	X	F
Chromic Acid	X	X	X	X	C
Carbolic Acid	X	X	X	C	X

<b>SALTS:</b>					
Ammonium Hydroxide	C	C	C	C	A
Sodium Hydroxide					
Calcium Hydroxide					
Magnesium Hydroxide	A	A	A	A	A
Potassium Hydroxide					
Sodium Chloride	A	A	A	A	A
Potassium Chloride					
Zinc Chloride	C	C	C	C	A
Sulphur Dioxide	X	X	X	X	X

<b>MISCELLANEOUS:</b>					
Hydrogen Peroxide	A	F	F	A	F
Chlorine Gas—Dry	F	F	A	F	F
—Wet	F	F	F	F	F
Ammonia Gas—Cold	A	A	A	A	A
—Hot	C	C	C	A	C

A—Good.  
F—Fair.  
C—Depends on conditions.  
X—Unsuitable.  
\*—Discolors.

Turn Page

## P&H ELECTRIC HOISTS

Imagine!

A P&H

ZIP-LIFT

AT THIS  
NEW  
LOW PRICE



ONLY  
\$199.50

1-ton capacity

A real wire rope hoist!

Of course you prefer the Zip-Lift! With all its quality features, who wouldn't! But if higher cost has stopped you, here's good news. It is now available with improved rope control (one pendant, *not two*), for simple, easy, trouble-free operation — for only \$199.50. It is the same Zip-Lift in other respects — same quality — new type control. *What a buy!*

Call your Zip-Lift Dealer  
Or write us for Bulletin H-29

Available also with full electric push-button control.

Other models up to 15-tons capacity

P&H ELECTRIC HOIST DIVISION  
**HARNISCHFEGER**  
CORPORATION

Milwaukee 46, Wis.

**NONE BETTER... America's First and Safest**

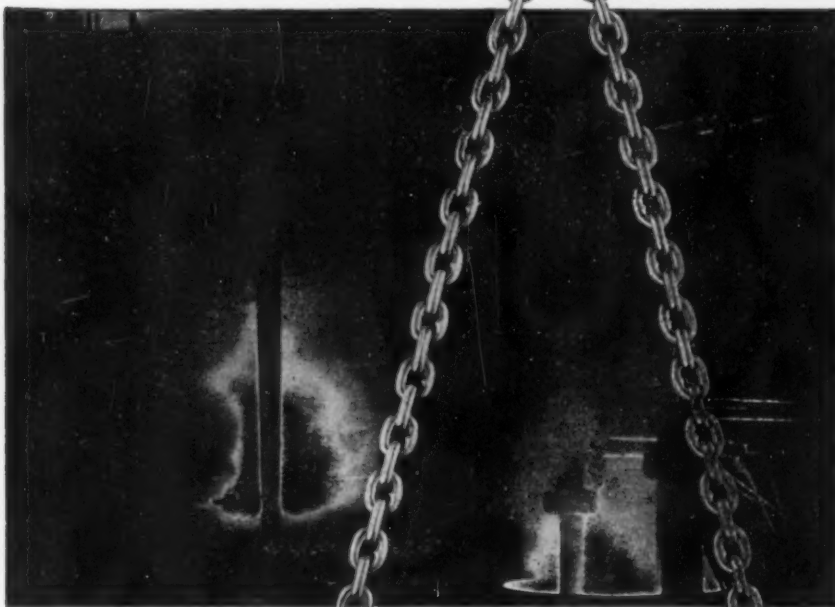
# HERC-ALLOY

## SLING CHAINS

**STRENGTH**—Size for size, no other sling chain offers a greater tensile strength. HERC-ALLOY will not crystallize—never requires annealing.

**SAFETY**—HERC-ALLOY Sling Chains are made to your specifications. Every new sling carries a written guarantee, is registered and tested before shipping. This registration serial number is carried at the top link.

● Serial number permanently affixed near top link for positive identification.



● Identify HERC-ALLOY by the patented Inswell side weld with the extra swell of metal on the inside of the link.



**EFFICIENCY**—Lighter, stronger HERC-ALLOY Sling Chains feature the exclusive short, narrow link design which holds firmer, less tendency to kink, less gouging. Workmen handle HERC-ALLOY with less effort.

**PREFERENCE**—Men who buy and use sling chains are influenced only by facts learned through experience. HERC-ALLOY Sling Chain preference has been built up over the years, not just by what we say, but by how HERC-ALLOY performs on the job.

*Write* for Data Book No. 3 which contains much useful manufacturing and application information on HERC-ALLOY Sling Chains.

## COLUMBUS McKINNON CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corp.)

**GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.**

**District Offices: New York • Chicago • Cleveland**

Other Factories at Angola, N. Y., Dixon, Ill., St. Catharines, Ont., and Johannesburg, South Africa.

### —Technical Briefs—

#### SMALL MILL:

Tailored to needs with standard interchangeable parts.

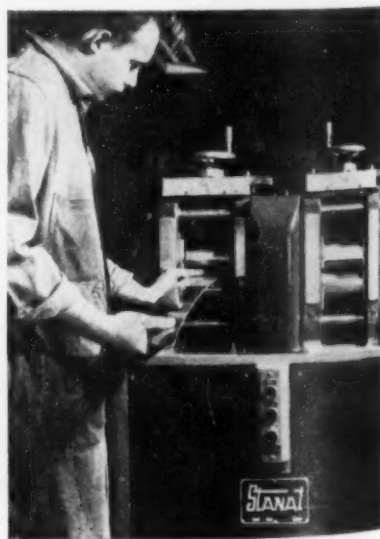
The trend to use of more interchangeable, standard parts in manufacture of the tools of industry shows up in a recently designed small rolling mill. The mill, embodies a versatility and ruggedness usually reserved for only the heaviest types of equipment.

The three and four inch mills, developed by Stanat Mfg. Co., Long Island City, N. Y., were designed to meet the requirements of rollers catering to electronics, optical, jewelry and other industries using metal rolled on small mills.

#### Variety of Rolls

Rolls are furnished either flat or grooved to produce a great variety of shapes such as round, square, half-round, diamond, or special shapes for individual requirements. Rolls are also supplied for such purposes as reducing or compacting small tubing sizes.

Greater versatility is achieved by mounting standard units in various combinations. Typical groupings are: Two sets of flat rolls, one for roughing, one for finishing; one set of flat rolls and one set of wire rolls; two sets of wire rolls to greatly increase the range of the machine; two sets of flat rolls, one for



OPERATOR ROLLING flat stock on combination flat and wire rolling mill.

**Turn to Page 152**

Lamson



## Blue Monday!

A washer's a "washout" without fasteners. But luckily for the housewives of America this catastrophe can never happen.

For Lamson & Sessions has long worked hand in glove with the appliance people to develop dependable engineered fasteners for home appliances.

If you, too, want to be *sure* of the "just right" fasteners for your product, check with Lamson during the planning stage. Our engineers will be happy to help you with your selection and possibly suggest fasteners that will save time and money on the assembly operation.

Remember, no matter what your fastener requirements, it's always *pleasant* and *profitable* to do business with Lamson & Sessions.

### TAPPING SCREWS For Fast Sheet-Metal Fastening



Self-tapping screws require no nuts, no tapped holes. Therefore, they are important time-savers on all sheet metal assembly work. A choice of type "A", "B" and "C" threads. Heads available with slotted or Phillips driver recesses.

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#### PLUG NUTS

Ideal for blind or hard-to-reach places.



#### TAPPING SCREWS

Choice of round, pan, truss, flat oval, hexagon and Phillips heads.



#### CAP SCREWS

Bright and "1035" Hi-Tensile Heat-treated steel.



#### SQUARE AND HEX NUTS

Semi-finished, hot pressed, cold forged.



#### LOCK NUTS

Economical, vibration proof. Can be used repeatedly.



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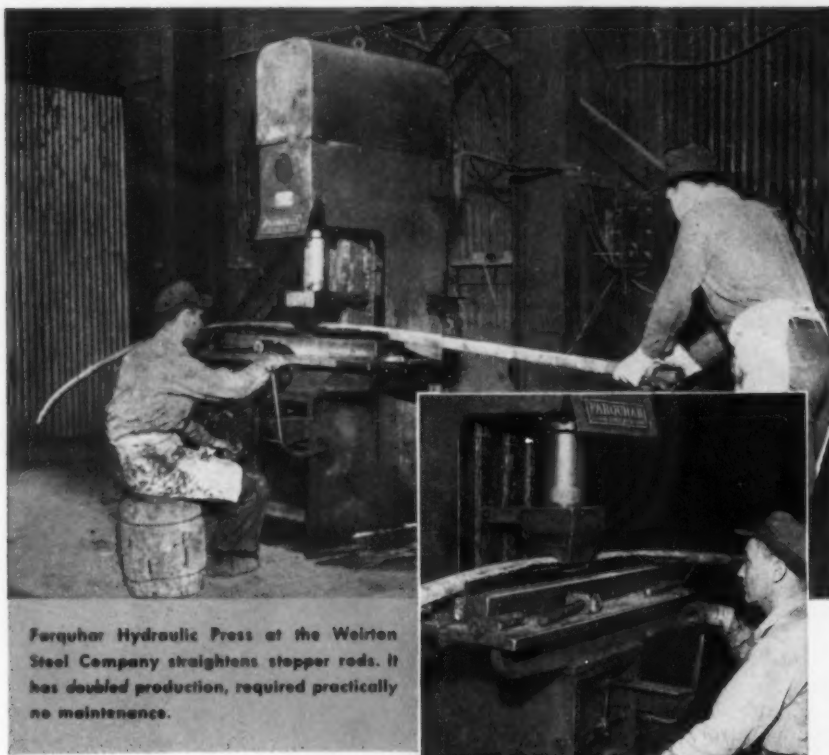
Steel, brass, aluminum and stainless steel.



#### "1035" SET SCREWS

Cup point type, hardened and heat-treated.





Farquhar Hydraulic Press at the Weirton Steel Company straightens stopper rods. It has doubled production, required practically no maintenance.

## Farquhar Hydraulic Press at the Weirton Steel Co.

**"eliminates breakage of rods...increases production 100%"**

The Weirton Steel Co., Weirton, W. Va., formerly straightened stopper rods with a steam hammer. The operation was slow and resulted in a high percentage of breakage. Seeking a better method, Weirton officials bought a Farquhar Press to speed production. Not only has the press increased production 100%, but it has eliminated breakage of rods. In addition, Weirton reports that in the six years this press has been operating, "practically no maintenance has been necessary."

### Farquhar Presses Cut Your Costs

Just one more example of cost-cutting Farquhar performance in modern production! Farquhar Presses are

built for the job... assure faster production due to rapid advance and return of the ram... greater accuracy because of the extra guides on the moving platen... easy, smooth operation with finger-tip controls... longer life due to positive control of speed and pressure on the die... long, dependable service with minimum maintenance cost.

Farquhar engineers are ready to help solve whatever production problem you may have. Send for free catalog showing Farquhar Built-for-the-Job Presses in all sizes and capacities. Write to THE OLIVER CORPORATION, A. B. Farquhar Division, *Hydraulic Press Dept.*, 1503 Duke St., York, Pennsylvania.

# Farquhar

## HYDRAULIC PRESSES

for Bending • Forming • Forging • Straightening • Assembling • Drawing  
Extruding • Jogging • Forging • and other Metalworking Operations

THE OLIVER CORPORATION, A. B. FARQUHAR Division

### Technical Briefs

hot rolling and one for cold rolling. Mills can also be furnished with a built-in block to draw wire, or to provide tension during rolling.

#### Maintaining Parallelism

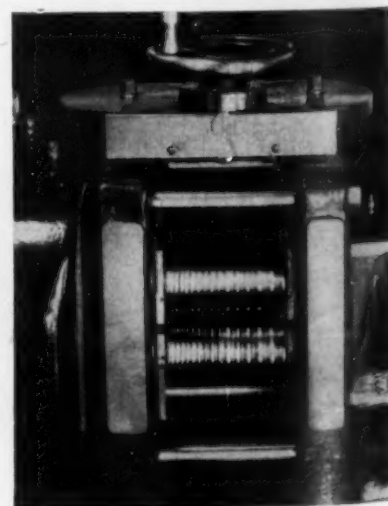
Housings are cast of Meehanite type GM alloy to withstand extreme stresses and shockloads. Heavy bronze bearings are completely enclosed within a heavy-duty welded steel cabinet-type base.

Parallelism is maintained by special hardened and ground screws, which can be adjusted individually, or by a single handwheel screw-down. A third type of adjustment using a worm gear screwdown is available for making fine adjustments while the machine is in operation. All units are equipped with large micrometer dials for easy reading.

#### Rolls Hardened, Ground

Rolls are normally supplied of special alloy tool steel, hardened and ground to a high finish. Where requirements call for patterned surfaces, rolls are supplied in the unhardened state so that designs can be engraved in. Special rolls are available for hot rolling, or with mirror finishes.

Compact design permits use of the machines where space is at a premium. Groupings are possible so that work formerly done on three machines can now be accomplished by a single mill.



GROOVED ROLLS of wire rolling head are also used to compact tubular heating units.

## TUBING:

British speed straightening of non-ferrous tubing.

British production of non-ferrous tubing in small to medium diameters is on the increase. To meet needs for faster straightening, high speed production equipment has been sought from American manufacturers.

Recently Serck Tubes, Ltd., of Birmingham, England, installed a Mackintosh - Hemphill rotary straightener. This machine straightens 70-30 brass tubing 5/16 in. in diam and 0.0333 in. wall thickness to meet a straightness specification of not more than 0.016 in. deviation in 6 ft. Serck reports this is approximately one-third of the standard tolerance requirements.

### Make Copper, Aluminum Tubing

The tube house produces copper, copper alloy and aluminum alloy tubing in sizes up to 4 in., and with wall thickness up to 3/16 in. Small sizes were, until recently, straightened on a locally-made machine which had a revolving die through which the tubing was pulled.

Serck reports this straightening operation was reasonably satisfactory. But, to secure more consistent results and higher production, an American machine was imported to bring tube straightening up to at least 120 fpm.



NONFERROUS TUBING 5/16 in. in diam is straightened at up to 120 fpm on this Mackintosh-Hemphill rotary straightener installed at plant of Serck Tubes, Ltd., Birmingham, England.

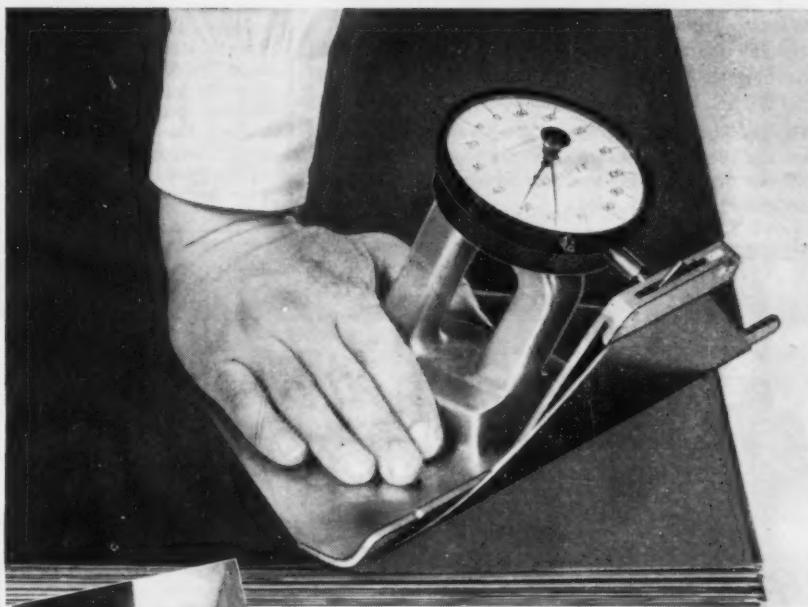
Turn Page

## Leading Stamping Plants, Warehouses and Steel Mills NOW use . . .

# FLEX-TESTER

FOR NON-DESTRUCTIVE  
TESTING OF SHEET METAL  
FOR DRAWING QUALITIES  
AND STRETCHER STRAIN

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SOLD EXCLUSIVELY BY STEEL CITY



MANUFACTURERS  
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FOR TESTING  
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BRINELL, DUCTILITY,  
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SPECIAL TESTING  
MACHINES  
AND PROVING  
INSTRUMENTS

FLEX-TESTER does its job quickly. Can be used to select sheets suitable for forming desired part. User can save better material for more severe draws; use poorer grade for simpler work. Enables application of material of uniform quality. Determines need for roller leveling, particularly on exposed panels where stretcher strain is detrimental. Hand operated; light weight; easily carried. Proven in use on hundreds of jobs. Write for descriptive bulletin or demonstration in your plant.

*Steel City*  
**Testing Machines Inc.**

8815 LYNDON, DETROIT 21, MICH.



**"Metallize 'em  
and forget 'em"**

**want to forget about rust for 20 years?**

Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides complete, dependable protection against atmospheric corrosion for upwards of 20 years without further maintenance. Such coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters, are eliminated. Protection is positive. "Metallize 'em and forget 'em!"

Why not find out more about how you can forget rust for 20 years or more? For descriptive Bulletin 62B—or the name of your nearest Metco Systems contractor—write or wire.

\*Reg. U.S. Pat. Off.

#### the Metco® Systems

—a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment. The *Metco Systems* provide for standardization of surface preparation, metal coating thicknesses and organic aftercoatings for various service conditions and appearance requirements.

## Metco Systems

Dept. A, 38-14 30th Street  
Long Island City 1, New York



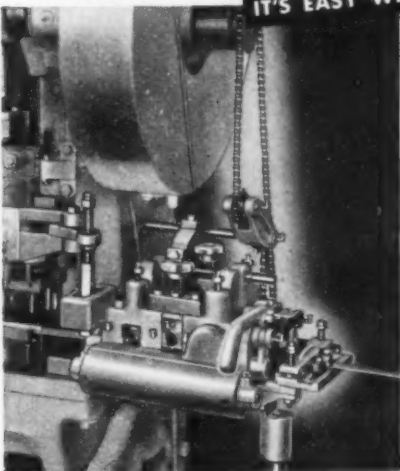
**GET RAPID-FIRE PRODUCTION**

from your **PUNCH PRESSES**

IT'S EASY WITH

## WITTEK

### Automatic Roll Feeds



Wittek automatic roll feeds fit all makes and sizes of punch presses—provide maximum efficiency and extreme accuracy in the high speed automatic feeding of strip stock. Made in single roll, double roll, and compound types with straighteners, in models to feed (push or pull) in any direction. Length of feed is easily adjusted to meet individual requirements.



4473

## WITTEK Reel Stands

Simplify Handling of Coiled Stock

Choice of standard models to facilitate handling coiled stock . . . from small, light coils to those weighing up to 800 pounds. Larger reel stands automatically center the coils — provide frictional braking action to prevent overrunning, maintain uniform coil slack.

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Full  
Particulars

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4329 W. 24th Place, Chicago 23, Illinois

Automatic  
ROLL FEEDS AND  
REEL STANDS



#### Technical Briefs

### LIFT CART:

Unusual hydraulic gadget moves jet engines deftly.

Cumbersome engines for jet and turbo-prop aircraft can now be moved easily and installed quickly with a new hydraulic-powered lift-cart developed by Lockheed Aircraft Corp.

#### Lifts Standardized

The versatile, easy-lift machine was designed by Lockheed engineers to afford a standardized piece of equipment adaptable to handle turbo-props as well as jets.

Heretofore different makes of engines required maintenance stands built to their individual specifications.

#### More Load Capacity

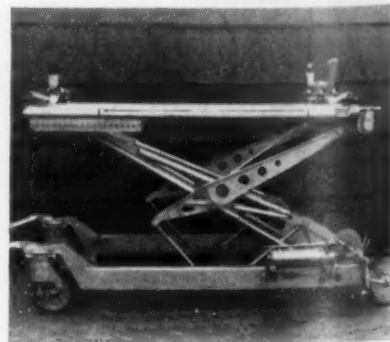
With 50 pct more load capacity than previous types, the new stand can lift up to 5000 lb. Besides handling engines, it can be utilized for moving fighter aircraft fuselage half-sections and other maintenance operations requiring lifting or hoisting.

#### Easy to Maneuver

Mounted on solid, castoring wheels the stand is more maneuverable than previous types. It features a three-speed hydraulic pump; a 48-in. vertical lift and can be finely adjusted for roll, pitch, yaw, longitudinal and lateral movements.

Dimensions are: 50-in. tread; 96-in. wheel base; 62-in. width; 114-in. overall length (excluding towbar).

The versatile, easy-lift machine can also be adapted to move fighter aircraft fuselage half sections.



JET AND TURBO-PROP engines are quickly installed with this hydraulic unit dreamed up by Lockheed Aircraft engineers.

Turn Page



# Maybe Sandvik can do this Spring Steel trick for you!



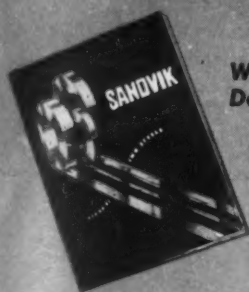
Naturally, Sandvik's stock of over 780 spring steel sizes includes many odd ones. The exact size and quality you want may be among them. Why not check with Sandvik?

In fact it makes sense to check with SANDVIK regardless of whether your size requirements are extraordinary or not. If spring steel performance is important to you, there's a good chance you'll find a SANDVIK steel that will suit you to a "T."

SANDVIK cold rolled, high carbon strip steel is available:

- From stock in over 650 cold-rolled, hardened and tempered sizes and over 130 cold-rolled, bright annealed sizes.
- Precision rolled in thicknesses to fit your requirements.
- In straight carbon and alloy grades.
- In special analyses for specific applications.
- Annealed, unannealed or hardened and tempered.
- Polished bright, yellow or blue.
- With square, round or dressed edges.

For further information contact your nearest Sandvik office.



Write for your free copy of this Sandvik Catalog.  
Describes 785 spring steel sizes.

## SANDVIK STEEL, INC.

111 EIGHTH AVE., N. Y. 11, N. Y., WAtkins 9-7180  
230 N. Michigan Ave., Chicago 1, Ill. • FRanklin 2-5638  
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Sandsteel Spring Division — New York — Industrial Springs  
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**1 generalift pallet crate**

**replaced 6 heavy nailed crates**

**cut packaging costs 50%**

**reduced shipping costs 25%**

McCord Corporation, Plymouth, Indiana, solved both a packaging and a materials handling problem with the Generalift Pallet Crate shown above. Conferences with General Packaging and Sales Engineers produced a crate which held 24 radiators, packed easily, and could be handled by fork-lift from the shipping room all the way to assembly lines. It formerly took 24 heavy nailed crates and from 24 to 30 hours of labor to ready 96 radiators for shipment. Packing the same number in Generalift Pallet Crates takes only 4 hours.

This is only one example of the many packaging problems solved every day—at a saving—in General Box Company's two fine Industrial Packaging Laboratories. General Box packaging experts stand ready to help you cut packaging costs, too. Write for complete details.

Find out how other manufacturers are cutting packaging costs. Write for your free copy of "The General Box."



**General Box COMPANY**  
1873 Miner St.,  
Des Plaines, Ill.

Factories: Cincinnati; Denville, N. J.; Detroit, East St. Louis, Kansas City, Louisville, Milwaukee; Prescott, Ark.; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston

**ENGINEERED SHIPPING CONTAINERS FOR EVERY SHIPPING NEED**

- Generalift Pallet Boxes
- Corrugated Fiber Boxes
- All-Bound Boxes
- Cleated Corrugated and Watkins-Type Boxes
- Wirebound Crates and Boxes

**Technical Briefs**

**MATERIALS HANDLING:**

**Conveyors and vibratory feeders speed heat treatment of parts.**

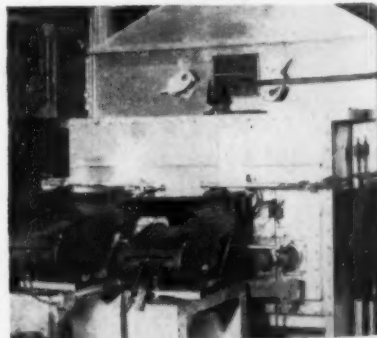
Small parts are being successfully carburized on a mass production basis by a midwestern auto maker through application of conveyors and vibratory feeders.

Parts are heat treated in a Surface Combustion rotary retort carburizer. Carburizer, oil quench, washer and draw furnace are interconnected by screw conveyors.

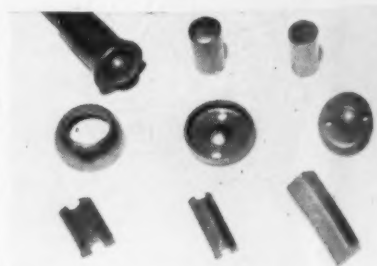
**Movements Automatic**

Conveyors, enclosed in rotary retorts within the carburizer and draw furnaces, extend into the enclosed quench and through the washer. All movements are completely automatic and integrated. The carburizer is equipped with gas-fired radiant tubes and utilizes enriched RX prepared atmosphere gas. Production rates average 368 lb per hr.

Continuous operation has provided consistently satisfactory results on a variety of small parts. At the same time the user has experienced considerable reductions in gas consumption, the elimination of much handling and a minimum of maintenance.



**CHARGE END** of rotary retort furnaces equipped with vibratory feeders.



**TYPICAL PARTS** carburized in the rotary retort furnaces.

## POWER TRANSMISSION:

Speed reducers built for steel mill in king size class.

Two worm gear speed reducers, in the king size class, were recently produced by De Laval Steam Turbine Co., Trenton, N. J.

These giants will drive transfer conveyors for the continuous and rugged service of moving heavy steel slabs. They will be installed in a new 45 in. Universal slabbing-blooming mill being built by the Mesta Machine Co.

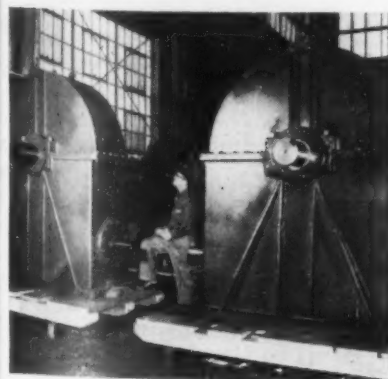
### For Moving Steel Slabs

The slab transfers, which the De Laval worm gear units will drive, are designed to convey steel slabs up to 12 in. thick and 42 in. wide, weighing over 55,000 lb.

The worm gear units, with a reduction ratio of 26-2/3 to 1 in a single set of gearing, are each driven by a 200 hp, 410 rpm, motor. The output shaft in turn is coupled to a separately supported sprocket shaft. The sprocket operates a chain equipped with dogs which gauge the steel slabs and transfer them from one point to another. Shock loading occurs as a dog engages each slab.

### Materials Used

A nickel alloy steel forging was used for the worm and the worm threads were carburized to provide a hard yet tough surface to withstand wear. High grade chill cast nickel bronze was selected for the gear to provide a material compatible with that of the worm.



THESE GIANT worm gear speed reducers built by De Laval Steam Turbine Co., for Mesta Machine Co. have a reduction ratio of 26 2/3 to 1. Each will be driven by a 200 hp, 410 rpm motor.

The arrangement for the worm involves a fixed bearing at one end for carrying thrust load in either direction as well as radial load. At the other end the bearing was arranged for carrying a radial load only and was not restrained endwise in the housing bore so that differential expansion of the worm could be accommodated. Tapered roller bearings are used on shafts.

## Reduces Maintenance Labor

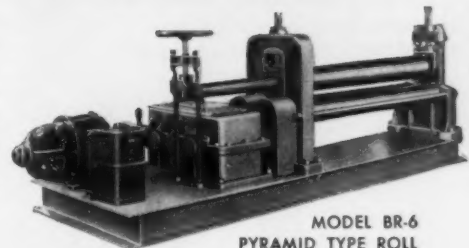
An improved type of adjustable torque-limiting clutch that provides overload protection for machine drives has been developed by Morse Chain Co., Detroit. The compact, slip type friction clutch acts as an automatic shear pin mechanism, eliminating the labor required to insert new shear pins.

# WEBB

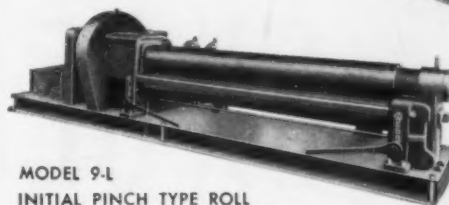
## PLATE FABRICATING MACHINERY

### PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2 1/2" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL BR-6  
PYRAMID TYPE ROLL

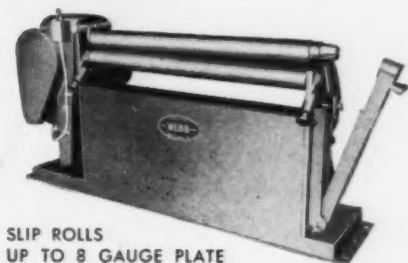


MODEL 9-L  
INITIAL PINCH TYPE ROLL

Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

### SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. E.

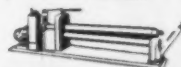


SLIP ROLLS  
UP TO 8 GAUGE PLATE

Let Speed PAY-The WEBB Way!



SLIP ROLLS



PYRAMID TYPE ROLL



INITIAL TYPE ROLL



STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

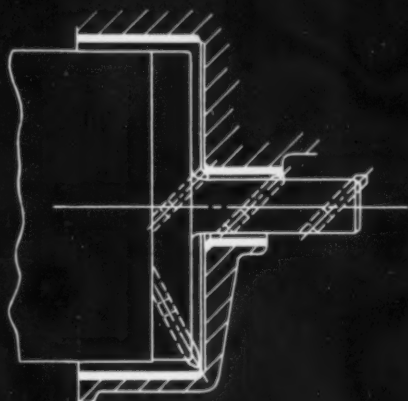
Since 1881  
**THE WEBB CORP.**

WEBB CITY, MO., U. S. A.





Fixture on this Ex-Cell-O Special Precision Boring Machine indexes between the loading position (shown) and the boring position.



This sketch shows one of the boring heads with tools, and the workpiece with machined surfaces indicated by heavy lines.

**EX-CELL-O**  
CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS  
CUTTING TOOLS • RAILROAD PINS AND BUSHINGS  
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

# Another **UNUSUAL** **PART BORED WITH AN** **EX-CELL-O** *Precision Machine*

The tank transmission housing shown here is cast aluminum, roughly 40" long, 34" wide, 14" deep.

Two areas, side-by-side, require identical operations:

- (1) rough and finish-bore a hole  $1\frac{3}{4}$ " in diameter, and
- (2) finish-bore a  $9\frac{1}{4}$ " diameter,  $3\frac{1}{2}$ " deep. Limits of small bore are plus-or-minus .0005", with finish free from tool drag back lines.

EX-CELL-O MACHINES ARE PUTTING PRECISION INTO MANY BIG PARTS: cylinder blocks and heads, aircraft crankcases and accessory drive cases, heavy forgings for guns and tanks. For suggestions on machining your parts—large or small—call your Ex-Cell-O representative or write, wire or phone Ex-Cell-O in Detroit today.

53-2



# Nation's Steel Bill Up \$800 Million at Current Rate

**Recent price increases total about \$9.30 a ton . . . Of this, \$4.30 is on base prices, about \$5 on extras . . . Steel scrap prices climb again . . . Ingot rate gains 2 points.**

Recent steel price increases have raised the nation's steel bill by more than \$800 million a year based on current rate of production. Altogether, prices have been raised an average of about \$9.30 a ton. Of this amount, \$4.30 represents base price increases and about \$5 is in the form of higher extra charges.

Base price increases last week raised The Iron Age Finished Steel Composite Base Price by \$4.30 per net ton. This weighted price index is based on prices of ten of the most common steel products accounting for the major portion of finished steel shipments. Index now stands at 4.632¢ per lb, compared to 4.417¢ per lb before the base price increases.

**Why Prices Are Up . . .** In addition to last week's base price increases steel companies raised extra charges on nearly all major products about 6 weeks ago. Average increase in extra charges is estimated at \$5 a ton.

Extra charges, which cover special costs incurred in processing steel to consumer specifications, were revised to correct inequities that had risen while steel prices were under controls. Base price increases, effective June 17, came just 5 days after signing of an 8½¢ per hr. wage increase. All things considered, the 8½¢ wage increase will cost steel companies about 10¢ an hr.

**Expect Some Decline . . .** If steel demand softens as expected during the next several months, the estimated \$800 million annual increase in the nation's steel bill will be reduced accordingly. Few

believe that consumer demand will be able to support the current high steelmaking rate for more than a few more months.

THE IRON AGE estimates the industry will produce about 112 million net tons of ingots this year. By maintaining operations close to 100 pct of rated capacity during the first 6 months, the industry will produce about 58.5 million net tons. In order to hit the 112 million ton mark for the year, only 53.5 million tons of steel would then have to be poured in the second 6 months. To accomplish this, steelmaking operations would have to average only 91 pct of rated capacity during the second half.

**Would Shave Cost . . .** The industry's official capacity is rated at 117.5 million net tons per year. Because of recently completed expansions, actual capacity is now about 120 million tons; this will rise to 123 million tons by the end of the year.

If steelmaking operations average 91 pct of rated capacity during the second half, the cost increase to consumers will be about \$372.9 million. This would amount to \$745.9 million on an annual basis.

**Had Been Expected . . .** Consumers generally were reacting philosophically to their higher steel costs. Higher prices had been predicted, and the increases were about what had been expected. Most steel users were wearing out pencils figuring how much their costs would go up.

The question on all minds is whether higher steel costs will be absorbed or passed on to the con-

sumer. One thing is sure—manufacturers will not pass higher steel prices on to the consumer as a matter of course. Quite the contrary—it appears that more of the higher steel costs will be absorbed than will be passed on to the public.

**Competition Stronger . . .** Those who feel they must raise prices of consumer goods will do so with great reluctance. Competitive forces are stronger than they have been for many months. These are the main conclusions drawn from an IRON AGE survey of steel consumers.

Steel's No. 1 customer, the auto industry, will absorb most of its higher steel costs. Major auto companies are depending on economies of high volume production, plus savings from less dependence on expensive conversion and foreign steel, to help offset higher cost of regular mill steel.

**Some Will Rise . . .** For smaller auto companies it will be tougher to hold the price line. Some may be forced to adjust their prices, but they will do so only as a last resort to keep selling price above costs.

Despite keen competition in the appliance industry, at least one large maker (General Electric) indicated it would raise prices of some of its larger appliances as a result of steel increases. Other appliance makers said they were delaying decision on price policy pending a study of steel costs.

The scrap market broke out with a rash of price increases this week. The Iron Age Steel Scrap Composite Price advanced \$1.67 a ton to \$42.17 per gross ton.

Steelmaking operations this week are scheduled at 99.0 pct of rated capacity, up 2 points from last week's revised rate.



You can keep  
speeds and feeds  
on the high side...

when machining  
*Carpenter* stainless!

If you believe all stainless steels are "alike", you may be missing this opportunity to run your stainless machining jobs faster, more profitably! Plant records prove there is a difference in the uniformity and machinability of different makes of Types 416 and 303 Stainless. These same records show that with Carpenter No. 5 (Type 416) or No. 8 (Type 303), jobs went through without a hitch... where with other makes reports showed trouble with rejects, tolerances or finishes. The job described below is a good example! Consistent stainless fabrication results like this are possible in your plant... because Carpenter makes stainless that takes a cut smoothly, at higher speeds... stainless that feeds through your machine with day-in, day-out uniformity. This steel comes to you from the same mill that invented the first Free-Machining Stainless. You'll never know what you're missing until you specify "Carpenter". Best proof in the world is a trial order. The Carpenter Steel Company, 121 W. Bern St., Reading, Pa.



After changing from an ordinary Type 303 to Carpenter Stainless No. 8 (Type 303) for this aircraft aileron control, the records show: 25% better machining, 10% less rejects, improved finishes that eliminated grinding.

Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"



*Carpenter*

STEEL

Free-Machining Stainless

takes the problems out of production

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor



# Market Briefs and Bulletins

**More Than One Price . . .** Policy of charging one customer a lower price than another has received support from Federal Trade Commission providing the price cut is made in good faith to prevent the customer from buying from a competitor. The commission also believes that such price reductions may include absorption of freight charges. Congress was informed of the FTC stand through a letter from F. Howrey, commission chairman.

**Ferromanganese Price . . .** Anaconda Copper Mining Co. has established a price of \$208 per net ton, f. o. b., Anaconda or Great Falls, Mont., for ferromanganese in lump form assaying 79 to 81 pct Mn. A premium or penalty of \$2.60 is given for each 1 pct above or below 81 to 79 pct manganese content. No change is expected in the grade of ferromanganese produced which has averaged 80 pct Mn.

**Locomotives Lag . . .** Assn of American Railroads reported last week that Class I railroads installed 1102 new locomotive units during the first 5 months of 1953. New units installed in May totaled 258, somewhat above this year's monthly average but 61 less than in the same month last year. New units now on order amount to 482 as of June 1, a drop of 958 from a year ago.

**Buy Rights to Brassert Process . . .** Dominion Foundries & Steel, Ltd., Hamilton, Ont., has confirmed earlier reports from Germany that it has purchased all Canadian rights to the Brassert process of producing steel directly from molten iron by using high-purity oxygen. Dominion plans to build a new furnace to utilize the Brassert process. It is reported that operating costs of the oxygen steel-making technique is three-fourths that of standard open-hearth methods and less than half that of electric furnace operations.

**Will Get More Copper . . .** A new materials contract has been signed by the government which is expected to result in 2750 tons of additional copper by June 30, 1956. Contract is with Copper Creek Consolidated Mining Co. which will use underground leaching to recover ore from the old Reliable Mine in the Bunker Hill district of Arizona. No money will be advanced for the \$150,000 worth of new facilities to be built, but the government has contracted to buy up to 2750 tons of refined output, beginning in 6 months, at a price of 29¢ f.o.b. midwest points.

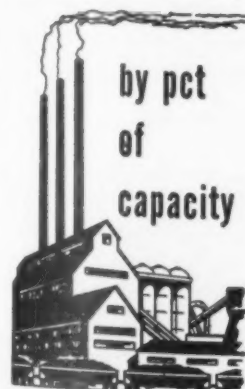
**Ore Price Hiked . . .** Standard grade Lake Superior iron ore prices have been boosted effective July 1. Prices for ore with a 51.50 pct iron content are 20¢ higher. Quotations per gross ton are: Mesabi, nonbessemer, \$9.90; Mesabi bessemer, \$10.05; Old Range nonbessemer, \$10.15; Old Range bessemer, \$10.30; and openhearth lump ore, \$11.15. All prices are delivered at lower Lake ports.

**Cut Carbide Tool Price . . .** General Electric's Carboloy Dept. has reduced prices on its general-purpose, single-point cemented carbide tools 15 pct. Tools affected by the price change are Styles A through G, plus roller turners. Price adjustments are also being made on several other styles of tool blanks.

**Record Construction Rate Continues . . .** Construction in the 37 states east of the Rockies continued its record-breaking pace. F. W. Dodge Corp. reports the 5-month 1953 construction total is \$6,792,329,000, 8 pct more than in the same period last year.

**Buy Tin Mill . . .** Republic Steel Corp. is the new owner of a government-built tinplate mill at Niles, Ohio. Reconstruction Finance Corp. approved sale of the 10-year-old facility which has been operated by Republic. Purchase price was about \$1,992,000.

## STEEL OPERATIONS

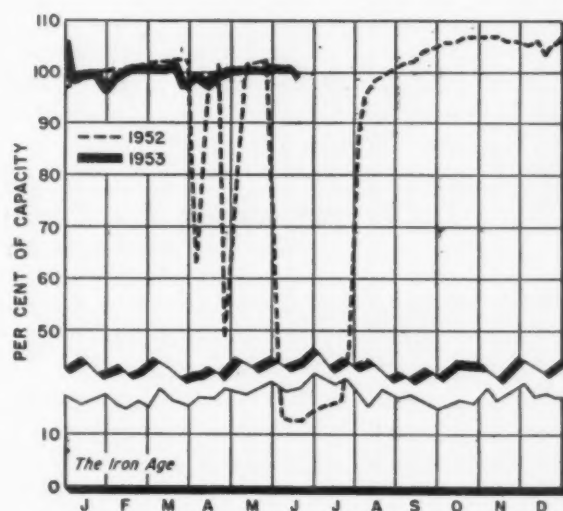


### District Operating Rates

District	Week of June 21	Week of June 14
Pittsburgh	100.0	99.0*
Chicago	104.5	103.5
Philadelphia	98.0	98.0
Valley	101.0	90.0*
West	108.5	101.5*
Cleveland	91.0	93.0
Buffalo	106.5	82.5
Detroit	105.0	104.0*
Birmingham (South)	101.0	101.0
Wheeling	101.0	101.0
South Ohio River	90.0	93.5
St. Louis	106.5	82.5
East	90.0	84.0*
AGGREGATE	99.0	97.0*

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

\* Revised



June 25, 1953

## Alcoa, USW Start Wage Discussion

**Labor follows tradition—waits for steel settlement, then hits aluminum producers . . . Will seek same agreement . . . Third aluminum round may wither—By R. L. Hatschek.**

Even sooner than anticipated the United Steelworkers turned from the amicably settled steel wage negotiations and started to work on the aluminum industry. First official meeting was Tuesday when Aluminum Co. of America was scheduled to sit down and talk over the situation with USW negotiators.

The contract between Alcoa and the CIO union expires on July 31. Reynolds Metals Co. faces the same deadline with the steelworkers union and informal discussions have already taken place. It's reported that no wage questions were tackled yet.

Kaiser Aluminum & Chemical Corp., which gave in earliest to union demands in last year's negotiations, remains quiet so far this year. Kaiser's contract had 2½ years to run but wage clauses are reopenable on July 1, this year.

**What Will Happen . . .** Traditional pattern in aluminum industry labor negotiations follows closely after the trend in steel. Workers wait for the conclusion of the steel talks, then ask substantially the same from aluminum producers.

Last year they got about 15¢ or 16¢ per hour additional wages from the aluminum industry plus

an annual 4¢ adjustment. Labor also won a cost of living adjustment and a cut in the North-South wage differential.

**Guaranteed Wage . . .** Expectation is that the union will ask a wage boost of about 10¢ per hour, as they did of the steel industry. And they'll probably go after all other aspects of the agreement, including the guaranteed annual wage. Only thing that won't be up for examination will be pensions.

Other unions representing aluminum workers will no doubt ask for a very similar package.

**No More Aid? . . .** Office of Defense Mobilization is taking a good close look at the third round aluminum expansion. This round was to add some 214,000 tons of annual capacity to the industry and was designed to do it by bringing three brand new producers into the primary aluminum field to make a total of seven.

But two of them, Olin Industries, Inc., and Wheland Co. ran into some financial difficulties. With credit tightening up and interest rates climbing, they found themselves unable to finance the rather expensive projects in the manner they wanted. So they asked for government financial aid.

**Buy Canadian Metal . . .** Meanwhile, Aluminum Co. of Canada was working to assure itself of future markets for its huge smelter at Kitimat, British Columbia, now in the building stage.

Both Alcoa and Kaiser contracted for huge slugs of metal from those facilities and the Canadian firm has also set aside substantial tonnage of pig and ingot for delivery to independent aluminum fabricators on this side of the border.

**Five, Not Seven . . .** Particularly in the light of the Administration's economy drive, it is doubtful that ODM will find the third round necessary enough for further assistance. The agency's decision is expected in about 2 weeks.

**Independents Get More . . .** According to General Services Administration, the Big Three of the aluminum industry will make some 45,000 tons of primary pig, ingot and billet available to independent fabricators during the third quarter.

Production has been running above 100,000 tons monthly since March and total output for third quarter is estimated at over 325,000 tons—that's conservative. GSA figures 110,000 tons of the third quarter output will be from new facilities installed under the first and second expansion rounds. These plants are now about 75 pct completed.

As mentioned last week, stockpiling schedule has been cut somewhat to allow civilian consumers of the light metal a bigger tonnage in the next quarter than they have been getting.

**Other Markets Quiet . . .** Zinc and lead are plodding along at current price levels with demand at a fair level. The same is true of copper but here it's expected that prices will be coming down from the 30¢ mark before too long.

Custom smelters and ingot makers have again reduced their copper scrap buying prices by ½¢.

### NONFERROUS METAL PRICES

(Cents per lb except as noted)

	June 17	June 18	June 19	June 20	June 22	June 23
Copper, electro, Conn. ....	29.75-	29.75-	29.75-	29.75-	29.75-	29.75-
	30.00	30.00	30.00	30.00	30.00	30.00
Copper, Lake delivered .....						
Tin, Straits, New York .....	92.00	92.00	92.50		93.50	93.50*
Zinc, East St. Louis .....	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis .....	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices.

\*Tentative

# MASTER ALLOYS and SPECIAL ALLOYS for STEEL MILL and FOUNDRY



Nickel Chrome 70/15 Ingot  
 Nickel Chrome 60/15 Ingot  
 Nickel Chrome 35/15 Ingot  
 Pure Copper Shot  
 Nickel Copper Shot 50/50  
 Nickel Copper Shot 70/30  
 60 Nickel 30 Copper  
 65 Nickel 30 Copper  
 Ferro-Nickel 50/50 Ingot and  
 Shot  
 Chromium Copper 5%  
 Chromium Copper 10%  
 Copper Iron 70/30  
 Copper Iron 90/10  
 Copper Iron 95/5

## ALTER

*Alloy Metal Division*

COMPANY

1701 Rockingham Road, DAVENPORT, IOWA

Phone 6-2561

Teletype DV 588



# Nonferrous Prices

(Effective June 23, 1953)

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

### Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188-in., 2S, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 48.6¢. 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 46.7¢. 0.032-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 46.6¢; 75S-O, 75S-OAL, 57.0¢.

Plate, ¼-in. and heavier: 2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 33.6¢; 24S-O, 24S-OAL, 36.4¢; 75S-O, 75S-OAL, 42.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.4¢ to 80.3¢; 12 to 14, 37.1¢ to 97.2¢; 24 to 26, 89.7¢ to 127.2¢; 36 to 38, 47.0¢ to 11.8¢.

Rod, Rolled: 1.064-in. to 4.5-in., 2S-F, 3S-F, 41.0¢ to 36.6¢; cold-finished, 0.375-in. to 3.499-in., 2S-F, 3S-F, 44.2¢ to 38.3¢.

Screw Machine Stock: Rounds, 11S-T3, ½ to 11/32-in., 58.4¢ to 45.9¢; ¾ to 1½-in., 45.3¢ to 42.6¢; 1 9/16 to 3-in., 42.0¢ to 39.3¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 43.2¢ to 31.7¢; 52S, 52.4¢ to 38.3¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 62.9¢ to 40.5¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.3¢; 6 to 9 in., 37.6¢ to 47.5¢.

Roofing Sheet: Flat, per sheet, 0.019-in., 2S x 72 in., \$1.247; x 96 in., \$1.662; x 120 in., \$2.077; x 144 in., \$2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.8¢.

### Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 66¢; 3/16 in., 68¢; ¼ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 61.5¢. Other alloys higher. Base up to ¼ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.5 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ¼ lb, 10,000 lb; ¼ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD, ¼ to 5/16 in., \$1.43; 5/16 to ¾ in., \$1.29; ¾ to 1 in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ¾ to 1 in., 84¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

### Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

### Nickel Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel Monel	Inconel
Sheet, CR	86½	67½
Strip, CR	92½	70½
Rod, bar	82½	65½
Angles, HR	82½	65½
Plate, HR	84½	66½
Seamless Tube	115½	100½
Shot, blocks	57	57

### Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	48.51	46.83	50.58
Copper, h-r	50.48	48.08	50.58
Copper, drawn	45.99	45.68	48.08
Low brass	42.87	42.56	45.68
Yellow brass	47.11	46.80	48.08
Red brass	47.01	41.07	42.33
Naval brass	48.76	48.45	39.95
Lead brass	50.73	44.62	46.18
Comm. bronze	70.50	70.75	70.75
Phos. bronze	44.91	40.47	41.72
Muntz metal	56.56	59.83	62.59
Ni silver, 10 pct			

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 20.50  
Aluminum pig 19.50  
Antimony, American, Laredo, Tex. 34.50  
Beryllium copper, per lb conta'd Be. 40.00  
Beryllium aluminum 5% Be, Dollars  
Blamouth, ton lots 72.75  
Cadmium, del'd 32.25  
Cobalt, 97-99% (per lb) 22.40 to 22.47  
Copper, electro, Conn. Valley 29.50 to 30.00  
Copper, Lake, delivered 35.00  
Gold, U. S. Treas., dollars per oz. 32.25  
Indium, 99.8%, dollars per troy oz. 32.25  
Iridium, dollars per troy oz. 165 to 175  
Lead, St. Louis 13.30  
Lead, New York 13.50  
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb. 27.00  
Magnesium, sticks, 100 to 500 lb. 45.00 to 47.00  
Mercury, dollars per 76-lb. flask, f.o.b. New York 190 to 193  
Nickel electro, f.o.b. N. Y. warehouse 63.08  
Nickel oxide sinter, at Copper Creek, Ont., contained nickel 56.25  
Palladium, dollars per troy oz. 24.00  
Platinum, dollars per troy oz. 93  
Silver, New York, cents per oz. 85.25  
Tin, New York 93.50  
Titanium, sponge 55.00  
Zinc, East St. Louis 11.00  
Zinc, New York 11.83  
Zirconium copper, 50 pct 36.20

## REMELTED METALS

### Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot  
No. 115 26.00  
No. 120 25.00  
No. 123 24.00  
80-10-10 ingot  
No. 305 30.00  
No. 315 28.00  
88-10-2 ingot  
No. 210 38.25  
No. 215 34.75  
No. 245 30.25  
Yellow ingot  
No. 405 21.25  
Manganese bronze  
No. 421 26.50

### Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys  
0.30 copper, max. 25.25  
0.60 copper, max. 24.75-25.00  
Piston alloys (No. 122 type) 23.00-23.75  
No. 12 alum. (No. 2 grade) 22.50-23.25  
108 alloy 22.75-23.50  
195 alloy 22.75  
13 alloy (0.60 copper max.) 24.75-25.00  
ASX-679 22.75-23.75

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½% 23.75-24.50  
Grade 2—92-95% 23.00-23.75  
Grade 3—90-92% 22.00-22.50  
Grade 4—85-90% 21.00-21.50

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper  
Cast, oval, 15 in. or longer 45.14  
Electrodeposited 37.98  
Flat rolled 45.64  
Brass, 80-20  
Cast, oval, 15 in. or longer 43.515  
Zinc, flat cast 20.25  
Ball, anodes 18.50  
Nickel, 99 pct plus  
Cast 79.50  
Roller, depolarized 80.50  
Cadmium 22.15  
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn. 94½

### Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 63  
Copper sulfate, 99.5 crystals, bbl. 12.85  
Nickel salts, single or double, 4-100 lb bags, frt. allowed 30.00  
Nickel chloride, 375 lb drum 35.00  
Silver cyanide, 100 oz lots, per oz. 75½  
Sodium cyanide, 95 pct domestic 200 lb drums 19.25  
Zinc cyanide, 100 lb drum 47.7

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over.)

	Heavy	Turnings
Copper	28½	27½
Yellow brass	21½	19½
Red brass	25½	24½
Comm. bronze	26½	25½
Mang. bronze	20	19½
Brass rod ends	19½	

### Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 23½  
No. 2 copper wire 22  
Light copper 20½  
Refinery brass 19½-20  
\* Dry copper content.

### Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire 23½  
No. 2 copper wire 22  
Light copper 20½  
No. 1 composition 18-18½  
No. 1 comp. turnings 17½-18  
Rolled brass 14-14½  
Brass pipe 14-14½  
Radiators 14-14½

### Aluminum

Mixed old cast 12½-13½  
Mixed new clips 15½-16  
Mixed turnings, dry 13½-14  
Pots and pans 13-13½

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

### Copper and Brass

No. 1 heavy copper and wire 23  
No. 2 heavy copper and wire 20  
Light copper 18  
New type shell cuttings 17  
Auto radiators (unsweated) 16½-17  
No. 1 composition 16-16½  
No. 1 composition turnings 16-16½  
Unlined red car boxes 15-16  
Cocks and faucets 11½  
Mixed heavy yellow brass 14  
Old rolled brass 14  
Brass pipe 14  
New soft brass clippings 16½-17½  
Brass rod ends 16-16½  
No. 1 brass rod turnings 15-16

### Aluminum

Alum. pistons and struts 6-6½  
Aluminum crankcases 12  
2S aluminum clippings 12  
Old sheet and utensils 9  
Borings and turnings 6½  
Misc. cast aluminum 9  
Dural clips (24S) 10

### Zinc

New zinc clippings 5½  
Old zinc 4½  
Zinc routings 3½  
Old die cast scrap 3½

### Nickel and Monel

Pure nickel clippings 100  
Clean nickel turnings 60-70  
Nickel anodes 100  
Nickel rod ends 100  
New Monel clippings 33-35  
Clean Monel turnings 35  
Old sheet Monel 30-32  
Nickel silver clippings, mixed 14  
Nickel silver turnings, mixed 13

### Lead

Soft scrap, lead 10½-11  
Battery plates (dry) 6-6½  
Batteries, acid free 4.40-4.50

### Magnesium

Segregated solids 15-16  
Castings 14-15

### Miscellaneous

Block tin 80  
No. 1 pewter 55  
No. 1 auto babbitt 45  
Mixed common babbitt 12-12½  
Solder joints 16½-16¾  
Siphon tops 45  
Small foundry type 16  
Monotype 14  
Lino. and stereotype 12½  
Electrotype 11  
Hand picked type shells 8½  
Lino. and stereo. dross 5  
Electro dross 4½



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*"Bristol-Fashion" means* **Brass at its Best**

## Pittsburgh No. 1 Heavy Grade Gains \$1

**Price pressure from outside districts pushes Pittsburgh price up another \$1 . . . Valley buying quiet . . . Broker buying reported . . . Washington decides to keep export controls.**

Repercussions of price strength from neighboring scrap centers has pushed up prices of steelmaking grades in the Pittsburgh district. This week, on an appraisal basis, the price of No. 1 heavy melting rose another \$1 to a top of \$44.

Last week's show of price strength in the Valley reached a plateau as the buying rate was quiet. Most other centers continued to idle along. In Chicago and St. Louis, broker buying was tightening up the market.

Philadelphia developed firmness in steelmaking grades, reporting increase of \$1 to \$2 per ton.

Last week in Washington Assistant Secretary of Commerce Sam Anderson made it clear that existing controls over the export of scrap will not be relaxed. He said some "carefully controlled" shipments of off-shore scrap will be permitted to friendly nations.

Mr. Anderson said the decision was based on a 2-month survey of the scrap situation. After consultation with the steel industry, the department decided controls were justified for the rest of 1953.

**Pittsburgh** — Reflecting a market condition brought about by activity in nearby consuming areas, prices of steelmaking grades moved upward again this week. On an appraisal basis, price of No. 1 heavy melting rose \$1 to a top of \$44. Other open-hearth grades moved up accordingly. While there has been no substantial activity to date, it was generally conceded that the market is stronger. A price of \$46 in the Valley has tended to siphon scrap from this area, already down to rock bottom from standpoint of dealer inventory.

**Chicago** — Despite an absence of any large mill sales, broker buying edged up here last week, with turnings reported purchased at \$26 and even

\$30. Some small mill sales had the effect of pushing an already tight market even higher, and general optimism began to be reported in railroad and electric furnace grades. Latter had remained weak after steelmaking grades tightened. Business in bundles was generally good, but some sources were having a little more difficulty moving heavy melting, except in premium grades.

**Philadelphia** — Steelmaking grades moved up \$1 to \$2 per gross ton this week putting No. 1 heavy at \$42 to \$43. There is definite strength in this end of the market. But Low phos and cast grades brought no enthusiasm as several electric furnace plants and foundries went out for summer vacations. Some cast items dropped in price.

**New York** — With the market pace holding at last week's levels, price rises in Pittsburgh and Valley districts had not yet encouraged any steep boosts here. Prices remained relatively stable. No. 1 heavy held at \$34 to \$35 but there were some minor adjustments in turnings. There is still some optimistic feeling here based on the hope that buying must increase substantially in a month or so.

**Detroit** — Market was very inactive last week with prices holding at the same general levels. Trade speculation centered around automotive lists closing this week. Indications are that bundles will continue at high price levels but an unusually large tonnage of blast furnace grades may point to a continued weakness there. Tone of the market is still not up to last month's bidding in which a few walked off with most of the tonnage.

**Cleveland** — Excitement following recent sale in the Valley has tapered off. Not much buying this week but there was more strength in rails as 3-ft. sections and 18-in. crops moved

up \$1 to \$54. Flow of turnings has slowed up somewhat as dealers dicker for top price. Quietness on the scrap front is expected to last for a few weeks because of vacations and hot weather.

**Birmingham** — Despite price increases in No. 2 heavy melting and No. 2 bundles brokers say they are having a hard time filling orders. Some dealers are holding on to inventories in the belief scrap will go higher, but all say not much is coming into the yards. Price hikes in other grades have not materialized as expected.

**St. Louis** — The market here is sharply up as a result of speculative buying by brokers. They feel that mills must come into the market soon and that there is a short supply of material available. Two lists of railroad scrap were taken by brokers at better than \$43 on tracks. Mills are buying little at the moment.

**Cincinnati** — Although there was relatively little activity in this market dealers and brokers generally expect better things in July. Consumers will answer the big question this week when they set buying prices for the coming month. Some observers believe steelmaking grades may go up \$2. Most think overall stability of this market will keep any rise gradual. Soft sales of cast in this foundry area aren't affecting the market.

**Boston** — Activity in the New England scrap market showed a slight flurry last week. Demand for No. 2 heavy melting steel was fair from the Pittsburgh and Weirton districts at \$1 less than last week's price. Cast remains as dull as ever with a total lack of demand for some grades.

**West Coast** — Mill intake remained steady with no price changes last week. Despite reports in the East of a pile-up on the West Coast, relatively minor tonnage, not in excess of 25,000, is in hands of four or five holdouts hoping for export licenses. Los Angeles No. 1 cupola cast market shows some life with a range of \$36 to \$38.



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 CLEVELAND, OHIO NEW YORK, N. Y. SAN FRANCISCO, CAL.  
 SEATTLE, WASH.

**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**

June 25, 1953

# Scrap Prices

(Effective June 23, 1953)

## Pittsburgh

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	43.00 to 44.00
No. 2 bundles	38.00 to 39.00
Machine shop turn	24.00 to 25.00
Mixed bor. and ms. turns	24.00 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs, plate	48.00 to 49.00
Heavy turnings	40.00 to 41.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	53.00 to 54.00
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
RR. couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	39.00 to 40.00
Malleable	46.00 to 47.00

## Chicago

No. 1 hvy. melting	\$39.00 to \$42.00
No. 2 hvy. melting	36.00 to 38.00
No. 1 factory bundles	41.00 to 43.00
No. 1 dealers' bundles	40.00 to 42.00
No. 2 dealers' bundles	33.00 to 35.00
Machine shop turn	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 26.00
Cast iron borings	24.00 to 25.00
Low phos. forge crops	47.00 to 48.00
Low phos. punch'gs, plate	43.00 to 45.00
Low phos. 3 ft and under	43.00 to 44.00
No. 1 RR. hvy. melting	43.00 to 45.00
Scrap rails, random lgth.	46.00 to 48.00
Rerolling rails	49.00 to 51.00
Rails 2 ft and under	50.00 to 51.00
Locomotive tires, cut	46.00 to 48.00
Cut bolsters & side frames	46.00 to 47.00
Angles and splice bars	47.00 to 49.00
RR. steel car axles	52.00 to 53.00
RR. couplers and knuckles	47.00 to 49.00
No. 1 machinery cast.	42.00 to 45.00
Cupola cast.	39.00 to 41.00
Heavy breakable cast.	34.00 to 35.00
Cast iron brake shoes	37.00 to 38.00
Cast iron car wheels	41.00 to 43.00
Malleable	40.00 to 41.00
Stove plate	33.00 to 35.00

## Philadelphia Area

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	32.00 to 33.00
Machine shop turn	26.00 to 27.00
Mixed bor., short turn.	30.00 to 31.00
Shoveling turnings	31.00 to 32.00
Clean cast chem. borings	38.50 to 39.00
Low phos. 5 ft and under	43.50 to 44.50
Low phos. 3 ft and under	45.00 to 46.00
Low phos. punchings	45.50 to 46.50
Elec. furnace bundles	43.50 to 44.50
Heavy turnings	39.50 to 40.50
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
Rails 18 in. and under	55.00 to 56.00
Cupola cast	37.00 to 38.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	46.00 to 47.00
Malleable	46.00 to 47.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	45.00 to 46.00
Charging box cast.	39.00 to 40.00

## Cleveland

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	42.00 to 43.00
Machine shop turn	24.00 to 25.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. 2 ft and under	46.00 to 47.00
Drop forge flashings	41.00 to 42.00
No. 1 RR. hvy. melting	47.00 to 48.00
Rails 3 ft and under	53.00 to 54.00
Rails 18 in. and under	53.00 to 54.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	38.00 to 39.00
Railroad cast	48.00 to 49.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	43.00 to 44.00
Malleable	48.00 to 49.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	46.00 to 48.00
No. 2 bundles	40.00 to 41.00
Machine shop turn	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. plate	47.00 to 48.00

## Buffalo

No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	38.00 to 39.50
No. 1 bundles	40.00 to 40.50
No. 1 busheling	40.50 to 41.50
No. 2 bundles	36.00 to 36.50
Machine shop turn	23.00 to 24.00
Mixed bor. and turn.	29.00 to 29.50
Shoveling turnings	30.00 to 30.50
Cast iron borings	29.00 to 29.50
Low phos. plate	44.00 to 45.00
Scrap rails, random lgth.	45.75 to 46.75
Rails 2 ft and under	51.75 to 52.75
RR. steel wheels	50.50 to 51.50
RR. spring steel	50.75 to 51.75
RR. couplers and knuckles	50.50 to 51.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

## Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles, openhearth	37.00 to 38.00
No. 2 bundles	29.00 to 30.00
New busheling	34.00 to 35.00
Drop forge flashings	34.00 to 35.00
Machine shop turn	16.00 to 17.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Electric furnace, bundles	37.00 to 38.00
Low phos. punch'gs, plate	37.00 to 38.00
No. 1 cupola cast	44.00
Heavy breakable cast.	36.00
Stove plate	36.00
Automotive cast.	44.00

## St. Louis

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 bundled sheets	31.00 to 32.00
Machine shop turn	15.00 to 16.00
Shoveling turnings	17.00 to 19.00
Cast iron borings	11.00 to 12.00
Rails, random lengths	46.00 to 48.00
Rails 18 in. and under	49.00 to 51.00
Locomotive tires, uncut.	43.00 to 44.00
Angles and splice bars	45.00 to 46.00
Std. steel car axles	53.00 to 54.00
RR. spring steel	43.00 to 44.00
Cupola cast.	40.00 to 41.00
Hvy. breakable cast.	33.00 to 35.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	38.00 to 39.00
Cast iron car wheels	43.00 to 44.00
Malleable	35.00 to 36.00
Unstripped motor blocks	33.00 to 34.00

## New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	30.00 to 31.00
No. 2 bundles	27.00 to 28.00
Low phos. 2 ft and less	37.00 to 38.00
Machine shop turn	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	22.50 to 23.50
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast.	42.00 to 43.00
Mixed yard cast.	33.00 to 34.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstripped motor blocks	22.00 to 23.00

## Birmingham

No. 1 hvy. melting	\$29.50 to \$30.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	29.50 to 30.50
No. 2 bundles	29.00 to 30.00
No. 1 busheling	29.50 to 30.50
Machine shop turn	20.75 to 21.75
Shoveling turnings	22.75 to 23.75
Cast iron borings	22.75 to 23.75
Electric furnace bundles	32.00 to 33.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR. hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	45.00 to 46.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	45.00 to 46.00
Std. steel axles	45.00 to 46.00
No. 1 cupola cast	39.00 to 40.00
Stove plate	35.00 to 36.00
Cast iron car wheels	46.00 to 47.00
Charging box cast.	30.00 to 31.00
Heavy breakable	30.00 to 31.00
Unstripped motor blocks	32.00 to 33.00
Mashed tin cans	17.00 to 18.00

## Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.35
No. 2 hvy. melting	27.00
No. 1 bundles	32.00
No. 2 bundles	26.00
No. 1 busheling	22.00
Elec. furnace, 3 ft & under	33.25
Machine shop turn	\$16.00 to 17.00
Mixed bor. and short turn.	20.00
Shoveling turnings	20.00 to 21.00
Clean cast chem. borings	38.17
No. 1 machinery cast	30.00 to 31.00
Mixed cupola cast.	26.00 to 28.00
Heavy breakable cast.	26.00 to 28.00
Stove plate	26.00
Unstripped motor blocks	22.00

## Cincinnati

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	32.00 to 33.00
Machine shop turn	19.00 to 20.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Low phos. 18 in. & under	46.00 to 47.00
Rails, random lengths	44.00 to 45.00
Rails, 18 in. and under	52.00 to 53.00
No. 1 cupola cast.	41.00 to 42.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast.	48.00 to 49.00

## San Francisco

No. 1 hvy. melting	\$28.00
No. 2 hvy. melting	24.00
No. 1 bundles	25.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Machine shop turn	10.00
Cast iron borings	15.00
No. 1 RR. hvy. melting	28.00
No. 1 cupola cast.	\$38.00 to 39.00

## Los Angeles

No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
No. 3 bundles	16.00
Mach. shop turn	8.00
Shoveling turnings	12.00
Cast iron borings	12.00
Elec. fur. 1 ft and under	29.00
No. 1 RR. hvy. melting	24.00
No. 1 cupola cast.	\$36.00 to 38.00

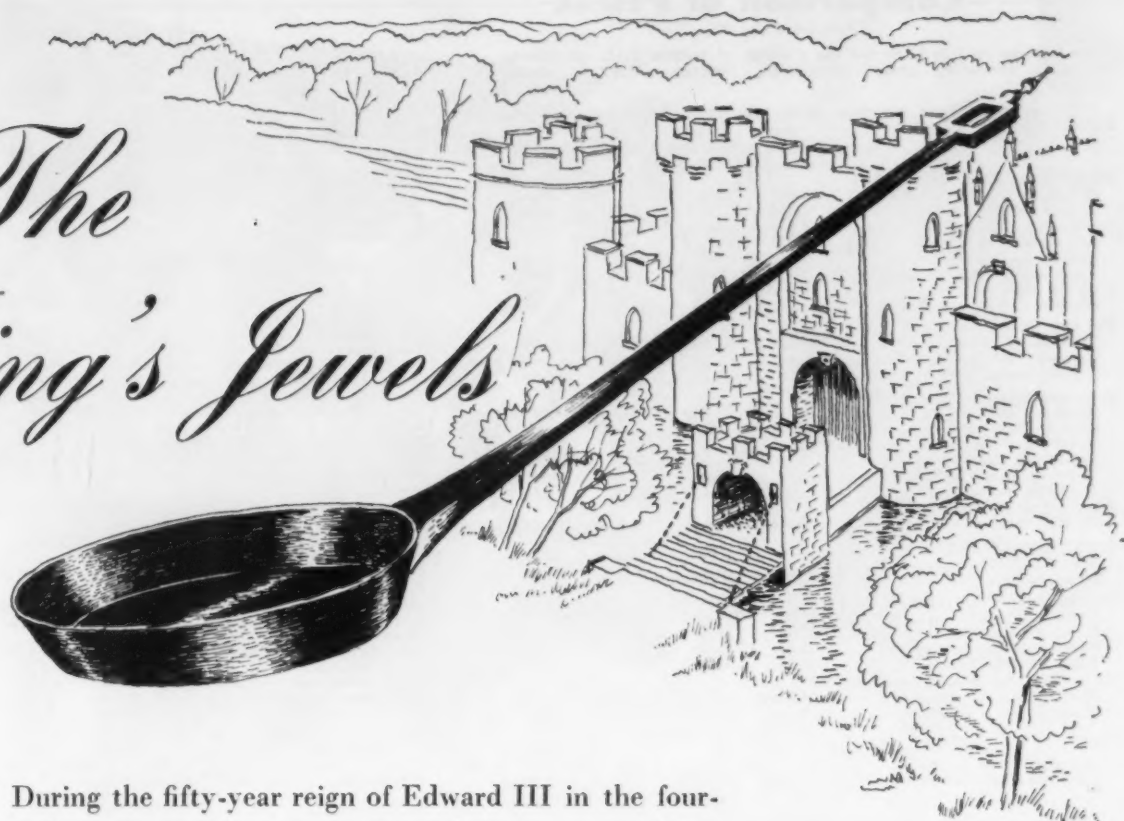
## Seattle

No. 1 hvy. melting	\$31.00
No. 2 hvy. melting	27.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

## Hamilton Ont.

No. 1 hvy. melting	\$32.00
No. 1 bundles	32.50
No. 2 bundles	32.00
Mechanical bundles	30.50
Mixed steel scrap	28.50
Bushelings	27.50
Bush., new fact. prep'd.	30.50
Bush., new fact. unprep'd.	29.50
Short steel turnings	26.50
Mixed bor. and turn.	26.50
Rails, remelting	32.50
Rails, rerolling	41.50
Cast scrap	50.00

# The King's Jewels



During the fifty-year reign of Edward III in the fourteenth century, "the pots, spits and frying pans of the royal kitchen were classed among the king's jewels"... In 1645, at Lynn, Mass., a one-quart kettle, the first iron casting made in America, was given to Thomas Hudson, younger brother of Hendrik Hudson, as part consideration for sixty acres of land.

Today, cooking utensils may not be so highly valued, but they represent one of the thousands of indispensable demands upon iron and steel production—for civilian and military requirements... To assure a continuity of this production, a constant supply of scrap must be maintained.

*For the purchase or sale of iron or steel scrap...*

*phone or write "Your Chicago Broker"*



231 S. La Salle St., Chicago

Telephone ANdover 3-3900



## Comparison of Prices

(Effective June 23, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	June 23 1953	June 16 1953	May 26 1953	June 24 1952
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	3.925¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.775	4.575	4.575	4.35
Galvanized sheets (10 ga)	5.275	5.075	5.075	4.80
Hot-rolled strip	3.925	3.725	3.725	3.50
Cold-rolled strip	5.513	5.20	5.20	4.75
Plate	4.10	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Stainl's C-R strip (No. 302)	41.50	39.75	39.75	36.75
<b>Tin and Terneplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$8.95	\$8.95	\$8.95	\$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. terne	7.75	7.75	7.75	7.50
<b>Bars and Shapes: (per pound)</b>				
Merchant bars	4.15¢	3.95¢	3.95¢	3.70¢
Cold finished bars	5.20	4.925	4.925	4.55
Alloy bars	4.875	4.675	4.675	4.30
Structural shapes	4.10	3.85	3.85	3.65
Stainless bars (No. 302)	35.50	34.00	34.00	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
<b>Wire: (per pound)</b>				
Bright wire	5.525¢	5.225¢	5.225¢	4.85¢
<b>Rails: (per 100 lb.)</b>				
Heavy rails	\$4.325	\$4.075	\$4.075	\$3.60
Light rails	5.20	5.00	5.00	4.00
<b>Semifinished Steel: (per net ton)</b>				
Re-rolling billets	\$62.00	\$59.00	\$59.00	\$56.00
Slabs, re-rolling	62.00	59.00	59.00	56.00
Forging billets	75.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	82.00	76.00	76.00	70.00
<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods	4.525¢	4.325¢	4.325¢	4.10¢
Skelp	3.75	3.55	3.55	3.35

<b>Composite: (per pound)</b>				
Finished steel base price	4.632¢	4.417¢	4.417¢	4.181¢

	June 23 1953	June 16 1953	May 26 1953	June 24 1952
<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$60.69	\$60.69	\$60.69	\$58.19
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti	58.93	58.93	58.93	56.53
Foundry, Birmingham	51.33	51.33	51.33	48.83
Foundry, Chicago	55.00	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.27
Basic, Valley furnace	54.50	54.50	54.50	52.00
Malleable, Chicago	55.00	55.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Ferromanganese, cents per lb.	10.00¢	10.00¢	9.85¢	8.06¢

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 pct Mn basis.

<b>Composite: (per gross ton)</b>	\$55.26	\$55.26	\$55.26	\$52.77
<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$43.50	\$42.50	\$38.50	\$42.50
No. 1 steel, Phila. area	42.50	40.50	40.50	37.50
No. 1 steel, Chicago	40.50	38.50	37.00	38.50
No. 1 bundles, Detroit	37.50	37.50	36.50	41.15*
Low phos., Youngstown	46.50	46.50	46.50	46.50*
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	52.75
No. 1 mach'y cast, Philadel'a.	45.50	47.50	47.50	52.00†
No. 1 mach'y cast, Chicago	43.50	43.00	42.00	43.50

\* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

<b>Composite: (per gross ton)</b>	\$42.17	\$40.50	\$38.67	\$39.50
<b>Coke, Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75
<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	29.875¢	29.875¢	29.875¢	24.50
Copper, Lake, Conn.	29.875¢	29.875¢	29.875¢	24.625
Tin, straits, New York	93.50†	92.50*	96.00	\$1.21½
Zinc, East St. Louis	11.00	11.00	11.00	15.00
Lead, St. Louis	18.30	18.30	18.30	15.50
Aluminum, virgin ingot	20.50	20.50	20.50	19.00
Nickel, electrolytic	63.08	63.08	63.08	69.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	39.00

† Tentative. ‡ Average. \* Revised.

## Composite Price Notes

### Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

### Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

### Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1) 500 to 1499 lb. (2) 20,000 lb or over. (3) 450 to 1499 lb.

## WARE-HOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge												
		Sheets			Strip		Plates	Shapes	Bars		Alloy Bars		
		Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As Rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As Rolled
Baltimore	\$.20	5.96	7.25	7.38	6.68	.....	6.55	6.59	6.56	7.64	.....	.....	.....
Birmingham	.15	6.00	7.35	7.70	5.80	.....	6.10	5.95	5.80	8.62	.....	.....	.....
Boston	.20	6.66	7.54	8.39	6.81	9.00‡	6.83	6.68	6.57	7.82	11.98	11.79	14.23
Buffalo	.20	5.95	6.85	8.70	6.30	.....	6.35	6.15	5.95	7.15	11.60	11.85	13.90
Chicago	.20	5.95	6.82	7.75	6.10	.....	6.03	6.07	5.98	7.025	11.45	11.85	14.15
Cincinnati	.20	5.96	7.00	8.17	6.40	.....	6.08	6.54	6.28	7.38	11.87	11.87	14.17
Cleveland	.20	5.95	6.82	7.95	6.27	.....	6.25	6.40	6.04	7.10	10.79	10.79	12.79
Denver	.....	5.96	6.83	8.04	.....	.....	6.25	7.55	7.60	8.80	11.59	11.59	15.25
Detroit	.20	6.15	7.00	8.04	6.39	7.05	6.55	6.54	6.26	7.32	11.97	11.57	12.82
Houston	.20	6.22	7.62	8.59	6.50	7.67	6.57	6.75	6.80	9.55	13.15	11.82	14.12
Kansas City	.20	6.75	7.00	8.62	6.95	.....	6.75	6.86	6.95	7.13	12.65	14.65	14.90
Los Angeles	.20	6.62	7.46	8.42	6.77	.....	6.75	6.74	6.65	7.80	11.87	11.87	14.90
Memphis	.10	7.05	8.70	8.45	7.05	10.10	6.90	6.75	6.85	9.40	12.45	11.95	14.50
Milwaukee	.20	6.56	7.40	8.90	7.20	10.85	6.71	6.80	6.95	10.10	13.00	12.75	15.35
New Orleans	.15	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
New York	.30	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
Philadelphia	.25	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
Pittsburgh	.20	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
Portland	.20	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
Salt Lake City	.20	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
San Francisco	.15	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
Seattle	.20	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
St. Louis	.20	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92
St. Paul	.15	6.12	7.50	8.60	6.60	.....	6.71	6.71	6.57	7.52	11.62	11.62	13.92

June 24  
1952

\$86.19  
\$7.46  
\$5.84  
48.88  
\$7.60  
\$7.27  
\$2.90  
\$2.90  
\$2.50  
8.06¢

Chicago

Min basis.

\$52.77

\$42.50  
\$7.50  
\$8.50  
41.15\*  
46.50\*  
\$2.75  
\$2.00†  
49.50

¢ fee.

\$30.50

\$14.75  
17.75

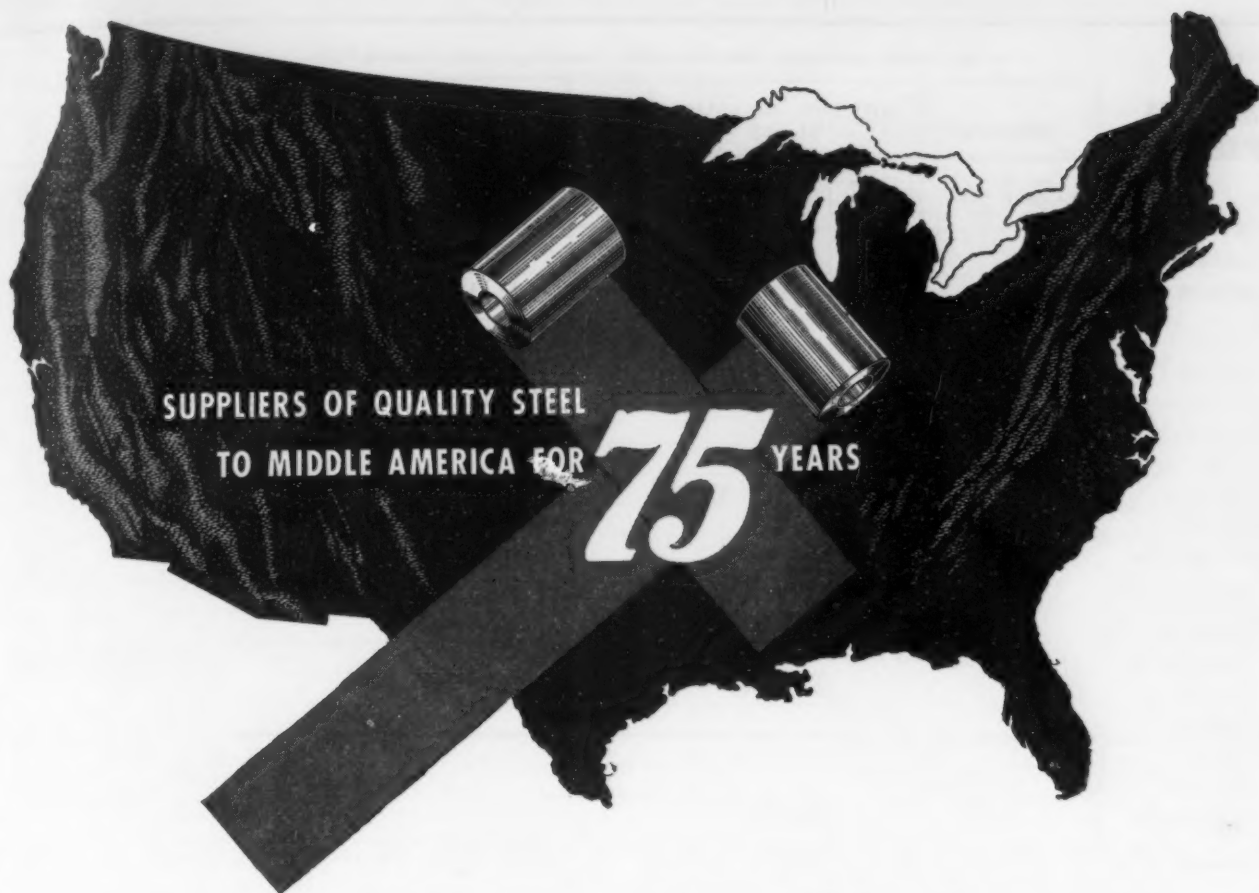
24.50  
24.625  
\$1.21 1/4  
15.00  
16.80  
19.00  
\$9.58  
24.50  
\$9.00

er 100 lb.

As Rolled  
Cold Drawn  
A 4140  
Annealed

14.25  
13.90-  
14.15  
13.75  
14.17  
12.79-  
13.89  
15.25  
12.82-  
14.12  
14.40-  
14.90  
14.55-  
15.55  
13.92  
14.14  
13.89  
13.75  
15.30-  
15.55  
15.30  
14.35

AGE



## Granite City Steel Marks Its 75th Year with an Expansion and Modernization Program To Help Serve You Better

Recognition comes hard here in the Middle West... but a reputation, once built, stands fast. We are glad that in this, our 75th year, grandsons of our first puddlers are producing steels and steel products for grandsons of our original customers. To us, it shows enduring faith in business reputation built the lasting way... through a record of technical accomplishment and service rendered.

A comprehensive modernization and expansion program going on right now at Granite City Steel means better steel, and more of it, leaving from St. Louis up and down the Mississippi. And, as always, you can count on the same expert, experienced handling of your steel problems that our long list of customers has learned to expect.

**OUR PRODUCTS:** Ingots • Hot Rolled Sheets  
Strongbarn Galvanized Roofing and Siding (Patented)  
Cold Rolled Sheets • Electrical Sheets • Tin Mill  
Products • Electrolytic Tin Plate • Porcelain Enameling  
Sheets • Fabricated Products • Hi-Strength Corruform  
Pig Iron • Coal Chemicals



**GENERAL OFFICE and PLANT**  
Granite City, Illinois

**DISTRICT SALES OFFICES:**  
Dallas, Texas • Kansas City, Missouri • Memphis,  
Tennessee • Minneapolis, Minnesota • St. Louis, Mo.

**GRANITE CITY STEEL COMPANY, Granite City, Illinois**

## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

**STEEL  
PRICES**(Effective  
June 23, 1953)

EAST

MIDDLE WEST

WEST

SOUTH

INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL- ING	SHAPES STRUCTURALS		STRIP			
Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
Bethlehem, Pa.				\$82.00 B3			4.15 B3	6.20 B3				
Buffalo, N. Y.		\$62.00 B3	\$75.50 B3, R3	\$82.00 B3		4.925 B3	4.15 B3	6.20 B3	3.925 B3, R3	5.45 B3	6.00 B3	8.425 B3
Claymont, Del.												
Coatesville, Pa.												
Conshohocken, Pa.									4.325 A2		6.20 A2	
Harrisburg, Pa.												
Hartford, Conn.												
Johnstown, Pa.		\$62.00 B3	\$75.50 B3	\$82.00 B3			4.15 B3	6.20 B3				
Newark, N. J.												
New Haven, Conn.										5.95 A5 6.20 D1		
Phoenixville, Pa.												
Putnam, Conn.												
Sparrows Pt., Md.									3.925 B3	5.45 B3	6.00 B3	8.425 B3
Worcester, Mass.												
Trenton, N. J.												
Alton, Ill.												
Ashland, Ky.									3.925 A7			
Canton-Massillon, Ohio			\$75.50 R3									
Chicago, Ill.		\$62.00 U1	\$75.50 R3, U1, W8	\$82.00 U1, W8		4.925 U1	4.10 U1, W8	6.175 U1	3.925 A1, W8	5.95 A1		
Sterling, Ill.												
Cleveland, Ohio			\$75.50 R3							5.45 A5, J3		7.80 J3
Detroit, Mich.	\$63.00 R5		\$78.50 R5	\$85.00 R5					4.225 G3	5.65 G3 5.95 D1	6.50 G3	8.50 G3
Duluth, Minn.												
Gary, Ind. Harbor, Indiana		\$62.00 U1	\$75.50 U1	\$82.00 U1, Y1		4.925 I3	4.10 I3, U1	6.175 U1	3.925 I3, U1, Y1	5.70 I3	5.95 U1	
Granite City, Ill.												
Kokomo, Ind.										5.45 A7		
Middletown, Ohio												
Niles, Ohio Sharon, Pa.									4.225 S1	5.80 S1	5.95 S1	7.65 S1
Pittsburgh, Pa. Midland, Pa.	\$59.00 U1	\$62.00 U1	\$62.00 U1 \$62.50 J3	\$75.50 J3, U1	\$82.00 U1	3.75 U1 3.85 J3	4.925 U1	4.10 J3, U1	6.175 J3, U1	4.425 S9	5.45 B4, J3	7.80 J3
Portsmouth, Ohio												
Weirton, Wheeling, Follansbee, W. Va.							4.35 W3		4.025 W3	5.45 F3, W3	6.30 W3	
Youngstown, Ohio						3.75 R3, U1			3.925 R3, U1	5.45 R3	5.95 U1	
Fontana, Cal.	\$86.00 K1	\$88.00 K1	\$81.00 K1	\$94.50 K1	\$101.00 K1			4.75 K1	6.825 K1	5.375 K1	7.35 K1	7.05 K1
Geneva, Utah				\$75.50 C7				4.10 C7	6.175 C7			
Kansas City, Mo.								4.80 S2		4.625 S2		7.10 S2
Los Angeles, Torrance, Cal.			\$94.50 B2	\$102.00 B2				4.80 B2, C7	6.85 B2	4.675 B2, C7		
Minnequa, Colo.												
San Francisco, Niles, Pittsburg, Cal.			\$94.50 B2					4.75 B2 4.91 P9	6.80 B2	4.675 B2, C7		
Seattle, Wash.			\$94.50 B2, S11					4.85 B2	6.90 B2			
Atlanta, Ga.										4.475 A8		
Fairfield, Ala. Alabama City, Ala.			\$62.00 T2	\$75.50 T2				4.10 R3, T2	6.175 T2	3.925 R3, T2	5.95 T2	
Houston, Texas				\$85.50 S2	\$92.00 S2			4.60 S2		4.425 S2		



*Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.*

IRON AGE

# STEEL PRICES

(Effective June 23, 1953)

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	STEEL PRICES
Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25 lb. base box	Hollowware Enameling 29 ga.	(Effective June 23, 1953)
													Bethlehem, Pa.
3.925 B3	4.775 B3				5.90 B3	7.225 B3							Buffalo, N. Y.
													Claymont, Del.
													Coatesville, Pa.
4.325 A2					6.15 A2								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.525 B3				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.925 B3	4.775 B3	5.275 B3			5.90 B3	7.225 B3	8.075 B3		4.625 B3	\$8.80 B3	\$7.50 B3		Sparrows Pt., Md.
									4.825 A5				Worcester, Mass.
													Trenton, N. J.
3.925 A7		5.275 A7	5.175 A7										Alton, Ill.
		5.275 R3											Ashland, Ky.
3.925 A1, W8					5.90 U1				4.525 A5				Canton-Massillon, Ohio
													Chicago, Ill.
3.925 J3, R3	4.775 J3, R3		5.175 R3		5.90 J3	7.225 J3			4.525 A5				Sterling, Ill.
4.125 G3	4.975 G3				6.375 G3	7.675 G3							Cleveland, Ohio
													Detroit, Mich.
													Duluth, Minn.
3.925 I3, U1, Y1	4.775 I3, U1, Y1	5.275 U1	5.175 I3, U1	5.675 U1	5.90 U1 6.40 Y1	7.225 U1 7.725 Y1				\$8.70 I3, U1, Y1	\$7.40 I3, U1	6.10 U1, Y1	Gary, Ind. Harbor, Indiana
		5.475 G2	5.875 G2								\$7.60 G2	6.30 G2	Granite City, Ill.
		5.375 C9											Kokomo, Ind.
	4.775 A7		5.175 A7	5.675 A7									Middletown, Ohio
4.225 S1				5.45 S1	5.90 S1						\$7.40 R3		Niles, Ohio Sharon, Pa.
3.925 J3, U1	4.775 J3, U1	5.275 U1	5.175 U1		5.90 J3, U1	7.225 J3, U1	7.925 U1		4.525 A5	\$8.70 J3, U1	\$7.40 J3, U1	6.10 U1	Pittsburgh, Pa. Midland, Pa.
	5.775 D1							4.725 D1					Portsmouth, Ohio
3.925 W3, W5	4.775 W3, W5	5.275 W3, W5		5.675 W3, W5		7.475 W3				\$8.70 W3, W5	\$7.40 W3, W5	6.55 W5	Weirton, Wheeling, Follansbee, W. Va.
3.925 R3, U1	4.775 R3				5.90 U1, R3	7.225 R3				\$8.70 R3			Youngstown, Ohio
4.70 K1	5.875 K1				7.00 K1	8.275 K1			5.325 K1				Fontana, Cal.
4.025 C7													Geneva, Utah
													Kansas City, Mo.
4.625 C7		6.025 C7						5.325 B2					Los Angeles, Torrance, Cal.
													Minnequa, Colo.
4.625 C7	5.725 C7	6.025 C7							5.175 C7	\$9.45 C7	\$8.15 C7		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.925 R3, T2	4.775 T2	5.275 R3, T2			5.90 T2			5.125 T2	4.525 T2	\$8.80 T2	\$7.50 T2		Fairfield, Ala. Alabama City, Ala.
													Houston, Texas

† Special coated mfg. terms deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct \$2.20 from 1.25-lb coke base box.  
\* COKES: 1.50-lb add 25¢.  
ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.

**STEEL  
PRICES**(Effective  
June 23, 1958)

STEEL PRICES (Effective June 23, 1953)		BARS					PLATES				WIRE	
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg's. Bright
EAST	Bethlehem, Pa.				4.875 B3	6.275 B3	6.225 B3					
	Buffalo, N. Y.	4.15 B3, R3	4.15 B3		4.875 B3, R3	6.275 B3	6.225 B3	4.10 B3			6.25 B3	
	Claymont, Del.											
	Coatesville, Pa.											
	Conshohocken, Pa.							4.55 A2	5.15 A2		6.50 A2	
	Harrisburg, Pa.											
	Hartford, Conn.			5.85 R3		6.775 R3						
	Johnstown, Pa.	4.15 B3	4.15 B3		4.875 B3		6.225 B3	4.10 B3		5.55 B3	6.25 B3	5.525 B3
	Newark, N. J.			5.70 W10		6.65 W10						
	New Haven, Conn.											
	Camden, N. J.											
	Putnam, Conn.			5.85 W10								
	Sparrows Pt., Md.		4.15 B3					4.10 B3		5.55 B3	6.25 B3	5.625 B3
	Worcester, Mass.											5.825 A5
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.											
	Ashland, Ky.							4.10 A7				
	Canton-Massillon, Ohio	4.15 R3		5.20 R2, R3	4.875 R3	6.325 R2, R3						
	Chicago, Ill.	4.15 R3, U1, W8	4.15 R3, 4.90 N4	5.20 A5, W10, W8, L2, 5.40 B5	4.875 U1, W8, R3	6.325 A5, W8, W10, L2, R3, 6.525 B5		4.10 U1, W8	5.15 U1	5.55 U1	6.25 U1	5.525 A5, R3, C13
	Cleveland, Ohio	4.15 R3	4.15 R3	5.20 A5, C13		6.325 A5		4.10 J3, R3			6.25 J3	5.525 A5, R3
	Detroit, Mich.	4.30 R5, 4.50 G3		5.35 R5, P8	5.025 R5, 5.225 G3	6.475 R5, P8	6.875 G3	4.65 G3			7.10 G3	
	Duluth, Minn.											5.525 A5
	Gary Ind. Harbor, Crawfordville, Indiana	4.15 J3, U1, Y1	4.15 J3, U1, Y1	5.20 R3	4.875 J3, U1, Y1	6.325 R3	6.225 U1, 6.725 Y1	4.10 J3, U1, Y1	5.15 J3	5.55 U1	6.25 U1, 6.75 Y1	
	Granite City, Ill.											
	Kokomo, Ind.											5.625 C9
	Sterling, Ill.	4.75 N4	5.00 N4									5.625 N4
	Niles, Ohio Sharon, Pa.							4.10 S1		5.70 S1	6.25 S1	
	Pittsburgh, Pa. Midland, Pa.	4.15 J3, U1	4.15 J3, U1	5.20 A5, J3, W10, R3	4.875 U1	6.325 A5, W10	6.225 J3, U1	4.10 J3, U1	5.15 U1	5.55 U1	6.25 J3, U1	5.525 A5, J3
	Portsmouth, Ohio											5.725 D1
	Weirton, Wheeling, Follansbee, W. Va.	4.30 W3						4.40 W3				
Youngstown, Ohio	4.15 R3, U1	4.15 R3, U1		4.875 U1		6.225 U1	4.10 R3, U1					
WEST	Fontana, Cal.	4.85 K1	4.85 K1		5.925 K1		7.475 K1	4.75 K1		6.60 K1	6.95 K1	
	Geneva, Utah							4.10 C7			6.25 C7	
	Kansas City, Mo.	4.85 S2	4.85 S2		5.755 S2						5.825 S2	
	Los Angeles, Torrance, Cal.	4.85 B2, C7	4.85 B2, C7	6.65 R3	5.925 B2		6.925 B2					
	Minnequa, Colo.											
	San Francisco, Niles, Pittsburg, Cal.	4.85 C7, P9, 4.90 B2	4.85 C7, P9, 4.90 B2				6.975 B2					6.475 C7
	Seattle, Wash.	4.90 B2	4.90 B2, S11				6.975 B2	5.00 B2			7.15 B2	
SOUTH	Atlanta, Ga.	4.45 A8	4.45 A8									
	Fairfield, Ala. Alabama City, Ala.	4.15 R3, T2	4.15 R3, T2				6.225 T 2	4.10 R3, T2			6.25 T2	5.525 R3, T2
	Houston, Texas Ft. Worth, Texas	4.65 S2	4.65 S2		5.375 S2			4.60 S2				

# Steel Prices

(Effective June 23, 1953)

## Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago  
A2 Alan Wood Steel Co., Conshohocken, Pa.  
A3 Allegheny Ludlum Steel Corp., Pittsburgh  
A4 American Cladmetals Co., Carnegie, Pa.  
A5 American Steel & Wire Div., Cleveland  
A6 Angell Nail & Chaplet Co., Cleveland  
A7 Armco Steel Corp., Middletown, O.  
A8 Atlantic Steel Co., Atlanta, Ga.  
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
B3 Bethlehem Steel Co., Bethlehem, Pa.  
B4 Blair Strip Steel Co., New Castle, Pa.  
B5 Bliss & Laughlin, Inc., Harvey, Ill.  
C1 Calstrip Steel Corp., Los Angeles  
C2 Carpenter Steel Co., Reading, Pa.  
C3 Central Iron & Steel Co., Harrisburg, Pa.  
C4 Claymont Products Dept., Claymont, Del.  
C5 Cold Metal Products Co., Youngstown  
C6 Colorado Fuel & Iron Corp., Denver  
C7 Columbia-Geneva Steel Div., San Francisco  
C8 Columbia Steel & Shifting Co., Pittsburgh  
C9 Continental Steel Corp., Kokomo, Ind.  
C10 Copperweld Steel Co., Glassport, Pa.  
C11 Crucible Steel Co. of America, New York  
C12 Cumberland Steel Co., Cumberland, Md.  
C13 Cuyahoga Steel & Wire Co., Cleveland  
D1 Detroit Steel Corp., Detroit  
D2 Detroit Tube & Steel Div., Detroit  
D3 Driver Harris Co., Harrison, N. J.  
D4 Dickson Weatherproof Nail Co., Evanston, Ill.  
E1 Eastern Stainless Steel Corp., Baltimore  
E2 Empire Steel Co., Mansfield, O.  
F1 Firth Sterling, Inc., McKeesport, Pa.  
F2 Fitzsimons Steel Corp., Youngstown  
F3 Follansbee Steel Corp., Follansbee, W. Va.  
G1 Globe Iron Co., Jackson, O.  
G2 Granite City Steel Co., Granite City, Ill.  
G3 Great Lakes Steel Corp., Detroit  
H1 Hanna Furnace Corp., Detroit  
I2 Ingersoll Steel Div., Chicago  
I3 Inland Steel Co., Chicago  
I4 Interlake Iron Corp., Cleveland

- J1 Jackson Iron & Steel Co., Jackson, O.  
J2 Jessop Steel Corp., Washington, Pa.  
J3 Jones & Laughlin Steel Corp., Pittsburgh  
J4 Joslyn Mfg. & Supply Co., Chicago

- K1 Kaiser Steel Corp., Fontana, Cal.  
K2 Keystone Steel & Wire Co., Peoria  
K3 Koppers Co., Granite City, Ill.

- L1 Laclede Steel Co., St. Louis  
L2 La Salle Steel Co., Chicago  
L3 Lone Star Steel Co., Dallas  
L4 Lukens Steel Co., Coatesville, Pa.

- M1 Mahoning Valley Steel Co., Niles, O.  
M2 McLouth Steel Corp., Detroit  
M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.  
M5 Monarch Steel Co., Inc., Hammond, Ind.  
M6 Mystic Iron Works, Everett, Mass.

- N1 National Supply Co., Pittsburgh  
N2 National Tube Co., Pittsburgh  
N3 Niles Rolling Mills Co., Niles, O.  
N4 Northwestern Steel & Wire Co., Sterling, Ill.  
N5 Newport Steel Corp., Newport, Ky

- O1 Oliver Iron & Steel Co., Pittsburgh

- P1 Page Steel & Wire Div., Monessen, Pa.  
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
P5 Pittsburgh Screw & Bolt Co., Pittsburgh

- P6 Pittsburgh Steel Co., Pittsburgh  
P7 Portsmouth Div., Detroit Steel Corp., Detroit  
P8 Plymouth Steel Co., Detroit  
P9 Pacific States Steel Co., Niles, Cal.  
P10 Precision Drawn Steel Co., Camden, N. J.

- R1 Reeves Steel & Mfg. Co., Dover, O.  
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.  
R3 Republic Steel Corp., Cleveland  
R4 Roebling Sens Co. (John A.), Trenton, N. J.  
R5 Rotary Electric Steel Co., Detroit

- S1 Sharon Steel Corp., Sharon, Pa.  
S2 Sheffield Steel Corp., Kansas City  
S3 Shenango Furnace Co., Pittsburgh  
S4 Simonds Saw & Steel Co., Fitchburg, Mass.  
S5 Sloss Sheffield Steel & Iron Co., Birmingham  
S6 Standard Forging Corp., Chicago  
S7 Stanley Works, New Britain, Conn.  
S8 Superior Drawn Steel Co., Monaca, Pa.  
S9 Superior Steel Corp., Carnegie, Pa.  
S10 Sweet's Steel Co., Williamsport, Pa.  
S11 Seidelhuber Steel Rolling Mills, Seattle

- T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
T2 Tennessee Coal & Iron Div., Fairfield  
T3 Tennessee Products & Chem. Corp., Nashville  
T4 Thomas Strip Div., Warren, O.  
T5 Timken Steel & Tube Div., Canton, O.  
T6 Tremont Nail Co., Warcham, Mass.  
T7 Texas Steel Co., Fort Worth

- U1 United States Steel Co., Pittsburgh  
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

- W1 Wallingford Steel Co., Wallingford, Conn.  
W2 Washington Steel Corp., Washington, Pa.  
W3 Weirton Steel Co., Weirton, W. Va.  
W4 Wheatland Tube Co., Wheatland, Pa.  
W5 Wheeling Steel Corp., Wheeling, W. Va.  
W6 Wickwire Spencer Steel Div., Buffalo  
W7 Wilson Steel & Wire Co., Chicago  
W8 Wisconsin Steel Co., S. Chicago, Ill.  
W9 Woodward Iron Co., Woodward, Ala.  
W10 Wycoff Steel Co., Pittsburgh

- Y1 Youngstown Sheet & Tube Co., Youngstown

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails		Woven Wire		Fence Posts		Single Loop Bale Ties		Twisted Barbed Wire		Galv. Barbed Wire		Merch. Wire Ant'ld		Merch. Wire <sup>o</sup> Galv.	
	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col
Alabama City R3	131	140	149	153	6.675	7.07										
Aliquippa, Pa. J3																
Atlanta A8																
Bartonsville K2																
Buffalo W6																
Chicago, Ill. N4	131	143	149	156	6.675	7.225										
Cleveland A6																
Cleveland A5																
Crawfordsville M4																
Donora, Pa. A5	131	140	149	153	6.675	7.075										
Duluth A5	131	140	149	153	6.675	7.075										
Fairfield, Ala. T2	131	140	149	153	6.675	7.075										
Houston S2																
Johnston, Pa. B3	131	143	149	156	6.675	7.225										
Joliet, Ill. A5	131	140	149	153	6.675	7.075										
Kokomo, Ind. C9																
Los Angeles B2																
Kansas City S2																
Minnequa C6																
Monessen P6																
Moline, Ill. R3			140													
Pittsburgh, Cal. C7	150	163	173	173	173	7.625	8.025									
Portsmouth P7																
Rankin, Pa. A5	131	140	149	153	6.675	7.075										
Sa. Chicago R3	131	140	149	153	6.675	7.075										
S. San Fran. C6																
Sparrows Pt. B3	133		151	158	158	6.775	7.325									
Struthers, O. Y1																
Worcester A5	137					6.975										
Williamsport, Pa. S10																

Cut Nails, carloads, base \$8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa., (A2).

\* Alabama City and So. Chicago don't include zinc extra Galvanized products based on zinc at 11.0¢ per lb.

## STAINLESS STEELS

Base price cents per lb. f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingot, re-rolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00		14.25
Slabs, billets, re-rolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25		18.50
Forg. discs, die blocks, rings										
Billets, forging	29.50	29.75	32.25	31.00	46.75	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	59.00	46.00	51.25	30.00	30.50	30.50
Sheets	46.25	46.50	48.75	48.75	64.50	55.50	60.75	40.75	41.25	43.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	55.00	42.00	46.50	26.25		27.00
Strip, cold-rolled	38.25	41.50	45.50	43.75	66.50	54.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2; (type 316 add 4.5¢) J2; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Lockport, N. Y., R4.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; (type 316 add 4.5¢) W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Lockport, N. Y., S4; Sharon, Pa., S1 (type 301 add 1/4¢); Butler, Pa., A7; Wallingford, Conn., W1.

Bars: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Lockport, N. Y., S4; Canton, O., T5; Ft. Wayne, J4.

Wires: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Butler, Pa., A7; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Lockport, N. Y., S4; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., [R3] Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.



# Miscellaneous Prices

(Effective June 23, 1953)

## PIPE AND TUBING

Base discounts f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD														SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. B3	23.75	8.0	26.75	12.0	29.75	15.5	31.75	16.0	32.75	17.0	33.25	17.5	34.75	18.0								
Youngstown R3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana K1	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh J3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. L1																						
Sharon M3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Pittsburgh N1	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheeling W5	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland W4	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown Y1	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor Y1	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain N2	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG																						
PLAIN ENDS																						
Sparrows Pt. B3	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown R3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana K1	16.75		20.75		22.75		23.25		23.75		24.25		24.75									
Pittsburgh J3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. L1																						
Sharon M3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Pittsburgh N1	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheeling W5	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland W4	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown Y1	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor Y1	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain N2	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb. East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/2 pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb. use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only butt-weld and seamless, 2 1/4 pts. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 4 1/2 pts. higher discount. Butt-weld jobbers' discount, 5 pct. East St. Louis zinc price now 11.0¢.

## COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa. ....	\$14.50 to \$15.00
Foundry beehive (f.o.b. oven)	
Connellsville, Pa. ....	\$16.50 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	28.75
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	14.60

## ELECTRICAL SHEETS

22 Ga. H-R cut length	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
F.o.b. Mill Cents Per Lb.							
Beech Bottom W5							
Brackenridge A3							
Granite City G2							
Ind. Harbor J3	7.85	8.35	9.60				
Mansfield E2							
Newport, Ky. N5	7.85	8.35	9.60	10.40	11.95		
Niles, O. N5							
Vandergrift U1	7.85	8.35	9.60	10.40	10.95	11.50	12.20
Warren, O. R3	7.85	8.35	9.60				
Zanesville A7	7.85	8.35	9.60	10.40	10.95	11.50	12.20

## CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	\$110.30 to \$113.80
6 to 24-in., del'd N.Y.	113.50 to 114.50
6 to 24-in. Birmingham	96.50 to 101.00
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	\$128.00 to \$130.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

## BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13				
	2 1/2	12				
	2	12				
	3 1/2	11				
	4	10				
National Tube	2	13		32.98	24.88	
	2 1/2	12		36.82	44.41	33.50
	3	12		42.52	51.28	38.69
	3 1/2	11		49.63	59.87	45.16
	4	10		63.91	79.50	59.97
Pittsburgh Steel	2	13				
	2 1/2	12				
	3	12				
	3 1/2	11				
	4	10				

## C-R SPRING STEEL

		CARBON CONTENT				
Cents Per Lb. F.o.b. Mill		0.26	0.41	0.61	0.81	1.06
		0.40	0.60	0.80	1.05	1.35
Bridgeport, Conn. S7*						
Carnegie, Pa. S9						
Cleveland A5	5.45	7.65	8.60	10.55	12.85	
Detroit D1						
New Castle, Pa. B4	5.80	8.00	8.60			
New Haven, Conn. D1						
Sharon, Pa. S1	5.80	8.00	8.60	10.55	12.85	
Weirton, W. Va. W3						
Worcester, Mass. A5	5.75	7.95	8.90	10.85	13.15	
Youngstown C5						

\* Sold on Pittsburgh base.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bethlehem B3	56.50	57.00	57.50	58.00		
Birmingham R3	50.88	51.38				
Birmingham W9	50.88	51.38				
Birmingham S5	50.88	51.38				
Buffalo R3	54.50	55.00	55.50			
Buffalo H1	54.50	55.00	55.50			66.75
Buffalo W6	54.50	55.00	55.50			
Chicago I4	54.50	55.00	55.00	55.50		
Cleveland A5	54.50	55.00	55.00	55.50	59.50	
Cleveland R3	54.50	55.00	55.00			
Daingerfield, Tex. L3	54.50	55.00	55.00			
Duluth I4	54.50	55.00	55.00	55.50		
Erie I4	54.50	55.00	55.00	55.50		
Everett, Mass. M6		59.50	60.00			
Fontana K1	60.50	61.00				
Geneva, Utah C7	54.50	55.00				
Granite City, Ill. K3	56.40	56.90	57.40			
Hubbard, Ohio Y1	54.50	55.00	55.00			
Jackson, Ohio J1.G1						65.50
Minnequa C6	56.50	57.50	57.50			
Monessen P6	56.50					
Neville Island P4	54.50	55.00	55.00	55.50		
Pittsburgh U1	54.50		55.00	55.50		
Sharpville S3	54.50	55.00	55.00	55.50		
Steelton B3	56.50	57.00	57.50	58.00	62.50	
Swedeland A2	58.50	59.00	59.50	60.00		
Toledo I4	54.50	55.00	55.00	55.50		
Troy, N. Y. R3	56.50	57.00	57.50	58.00	62.50	
Youngstown Y1	54.50	55.00	55.00	55.50		
N. Tonawanda, N. Y. T1		55.00	55.50			

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over. Silvery Iron: Add \$1.50 per ton net for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferro-silicon prices are \$1 over comparable silvery iron.

# Miscellaneous Prices

(Effective June 23, 1953)

## RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U1	4.325	5.20	5.275				
Chicago R3							
Cleveland R3							
Enley T2	4.325	5.20			5.125		
Fairfield T2		5.20			5.125		
Gary U1	4.325	5.20			5.125		
Ind. Harbor B3	4.325		5.275	7.05	5.125		
Johnstown B3		5.20					
Joliet U1		5.20	5.275				
Kansas City S2							
Lackawanna B3	4.325	5.20	5.275		5.125		
Lebanon B3							
Minnequa C6							
Pittsburgh R3							
Pittsburgh O1							
Pittsburgh P5							
Pittsburgh J3							
Pitt. G. Cal. C7					5.275		
Seattle B2					5.125		
Steelton B3	4.325		5.275				
Struthers Y1					5.275		
Torrance C7							
Youngstown R3							

## TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.505
18	4	1	—	5	\$2.13
18	4	2	—	—	\$1.65
1.5	4	1.5	8	—	\$1.04
6	4	2	6	—	\$6.5
High-carbon chromium					\$3.5
Oil hardened manganese					\$2.5
Special carbon					\$2.5
Regular carbon					\$2.5
Warehouse prices on and east of Miss-					
issippi are 3.5¢ per lb. higher. West of					
Mississippi, 5.5¢ higher.					

## CLAD STEEL

Add 4.7 pct to base and extras.

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. L4	\$29.5	
Washington, Pa. J2	\$29.5	
Claymont, Del. C4	\$29.50	
New Castle, Ind. I2	\$29.77	\$26.24
Nickel-carbon		
10 pct. Coatesville, Pa. L4	32.5	
Inconel-carbon		
10 pct. Coatesville, Pa. L4	40.5	
Monel-carbon		
10 pct. Coatesville, Pa. L4	33.5	
No. 302 Stainless copper stainless, Carnegie, Pa. 44		77.00
Aluminized steel sheets, hot dip, Butler, Pa., 54.7		7.75
* Includes annealing and pickling, sandblasting.		

## ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
24	84	20.50
18, 20	72	20.00
12, 14	72	20.50
7 to 10	60	21.00
6	60	23.25
4	40	26.00
3	40	27.50
2 1/2	30	28.00
2	24	43.50
CARBON		
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	72	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

## FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill.  
Price, net ton; Effective CaF<sub>2</sub> content:  
72 1/2% ..... \$44.00  
70% or more ..... 42.50  
60% or less ..... 38.00

## BOLTS, NUTS, RIVETS, SCREWS

### Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

### Nuts, Hot Pressed, Cold Punched—Sq.

Pot Off List	Less	Less	Less	Less
Keg	K.	Keg	K.	K.
1/2 in. & smaller	10	24	10	24
9/16 in. & 5/8 in.	8	21	1	16
3/4 in. to 1 1/2 in.				
inclusive	4	18	+4	12
1 1/2 in. & larger	2	17	+4	12

### Nuts, Hot Pressed—Hexagon

1/2 in. & smaller	22	33	18	30
9/16 in. & 5/8 in.	12	25	1	16
3/4 in. to 1 1/2 in.				
inclusive	8	21	+3	13
1 1/2 in. & larger	4	18	+3	13

### Nuts, Cold Punched—Hexagon

1/2 in. & smaller	22	33	18	30
9/16 in. & 5/8 in.	19	31	13	26
3/4 in. to 1 1/2 in.				
inclusive	15	27	8	21
1 1/2 in. & larger	2	17	+4	12

### Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
1/2 in. & smaller.	33	43
5/16 in. & 3/8 in.	27	38
3/4 in. to 1 1/2 in.		
inclusive	21	33
1 1/2 in. & larger.	5	19
	Light	net
7/16 in. & small- er	33	43
1/2 in. thru 5/8 in.	26	37
3/4 in. to 1 1/2 in.		
inclusive	18	30

### Stove Bolts

Packaged, steel, plain finished 44 1/2—10  
Packaged, plain finish ..... 25 1/2—10  
Bulk, plain finish\*\* ..... 59\*  
\*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.  
\*\*Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

### Rivets

Base per 100 lb  
1/2 in. & larger ..... \$8.50  
7/16 in. and smaller ..... 30

### Cap and Set Screws

(In bulk) Pot Off List  
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright ..... 40  
3/4 in. thru 1 in. up to & including 6 in. ..... 26  
1/2 in. thru 5/8 in. x 6 in. & shorter ..... 43  
high C double heat treat ..... 33  
3/4 in. thru 1 in. up to & including 6 in. ..... 17  
Milled studs ..... 12  
Flat head cap screws, listed sizes ..... 7  
Fillister head cap, listed sizes ..... 37  
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter

### Machine and Carriage Bolts

Pot Off List  
Less Case C.  
1/2 in. & smaller x 6 in. & shorter ..... 11 25  
9/16 in. & 5/8 in. x 6 in. & shorter ..... 15 27  
3/4 in. & larger x 6 in. & shorter ..... 14 26  
All diam. longer than 6 in. ..... 8 22  
Lag, all diam. x 6 in. & shorter ..... 19 31  
Lag, all diam. longer than 6 in. ..... 16 28  
Plow bolts ..... 30

## REFRACTORIES

### Fire Clay Brick

Carloads, per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.25) .. \$99.30  
No. 1 Ohio ..... 92.40  
Sec. quality, Pa., Md., Ky., Mo., Ill. .... 92.40  
No. 2 Ohio ..... 83.15  
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.60) ..... 14.40

### Silica Brick

Mt. Union, Pa., Ensley, Ala. .... \$99.30  
Childs, Pa. .... 103.95  
Hays, Pa. .... 105.10  
Chicago District ..... 122.40  
Western Utah ..... 116.55  
California ..... 122.85  
Super Duty, Hays, Pa., Athens, Tex., Chicago ..... 116.65  
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) ..... 17.30  
Silica cement, net ton, bulk, Hays, Pa. .... 19.60  
Silica cement, net ton, bulk, Ensley, Ala. .... 18.45  
Silica cement, net ton, bulk, Chicago District ..... 18.45  
Silica cement, net ton, bulk, Utah and Calif. .... 25.95

### Chrome Brick

Per net ton

Standard chemically bonded Balt., Chester ..... \$86.00  
Burned, Balt., Chester ..... 80.00

### Magnesite Brick

Standard Baltimore ..... \$109.00  
Chemically bonded, Baltimore ..... 97.50

### Grain Magnesite

St. %-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed ..... \$64.40  
Domestic, f.o.b. Chewalah, Wash., in bulk ..... 38.00  
in sacks ..... 43.70

### Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ ..... \$13.75

## LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices through June 30, 1953, delivery.

Gross Ton  
Openhearth lump ..... \$10.95  
Old range, bessemer ..... 10.10  
Old range, nonbessemer ..... 9.95  
Mesabi, bessemer ..... 9.85  
Mesabi, nonbessemer ..... 9.70  
High phosphorus ..... 9.70  
Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on Dec. 31, 1952. Increases or decreases after such date are for buyer's account.

## METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.  
Swedish sponge iron, c.i.f. .... 10.9¢  
Canadian sponge iron, del's. .... 12.0¢  
In East ..... 15.5¢ to 17.0¢  
Domestic sponge iron, 98+% Fe, carloads lots ..... 15.5¢ to 17.0¢  
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢  
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe ..... 60.0¢  
Hydrogen reduced iron, minus 300 mesh, 98+% Fe 53.0¢ to 80.0¢  
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe 83.0¢ to \$1.48  
Aluminum ..... 31.5¢  
Brass, 10 ton lots ..... 30.00¢ to 33.25¢  
Copper, electrolytic ..... 43.50¢  
Copper, reduced ..... 43.50¢  
Cadmium, 100-199 lb. .95¢ plus metal value  
Chromium, electrolytic, 99% min., and quantity, del'd. .... 33.50  
Lead ..... 21.75¢  
Manganese ..... 57.0¢  
Molybdenum, 99% ..... 32.75¢  
Nickel, unannealed ..... 88.0¢  
Nickel, annealed ..... 95.0¢  
Nickel, spherical, unannealed ..... 92.0¢  
Silicon ..... 33.5¢  
Solder powder 7.0¢ to 9.0¢ plus met. value  
Stainless steel, 302 ..... 83.9¢  
Stainless steel, 316 ..... 11.10  
Tin ..... 14.04¢ plus metal value  
Tungsten, 99% (65 mesh) ..... 25.50  
Zinc, 10 ton lots ..... 23.0¢ to 30.5¢

# Ferroalloy Prices

(Effective June 23, 1953)

## Ferrochrome

Contract prices, cents per pound, contained CR, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	34.50	0.20% C	33.50
0.10% C	34.00	0.50% C	33.25
0.15% C	33.75	1.00% C	33.00
2.00% C			32.75
65-69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

## S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

## Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	\$1.18
0.50% max. C	1.14
9 to 11% C	1.11

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

## Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Cr, 60-65% Si, 3.00% max. Fe

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

## Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

## CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

## SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/4 in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

## Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

## Ferromanganese

Maximum contract base price, f.o.b., lump size:

Producing Point	Base Mn Content (Contained Mn)	Cents per lb (Per lb of alloy)
Niagara Falls, Alloy, Ashtabula	76-80%	13.15
Etna, Clairton, Pa.	74-76%	10.00
Johnstown, Pa.	74-76%	10.00
Sheridan, Pa.	74-76%	10.00

Add or subtract 0.1¢ for each 1% Mn above or below base content.

Briquets—delivered, 66 pct. Mn.

Carload, bulk	12.50
Ton lots, packed	14.05

## Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	Price
16 to 19%	3% max.	\$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00
Premium for hydrogen-removed metal	1.50

## Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30 31.50
0.07% max. C	27.95	29.80 31.00
0.15% max. C	27.45	29.30 30.50
0.30% max. C	26.95	28.80 30.00
0.50% max. C	26.45	28.30 29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30 26.50

## Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn

21.35¢

## Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

## Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$95.50 gross ton, freight allowed to normal trade area.

Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00. Add \$1.05 per ton for each additional 0.50% Si up to and including 17%. Add \$1.00 for each 0.50% Mn over 1%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

36% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

## Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb SI briquets.

Carloads, bulk	6.95
Ton lots	8.55

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.00

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

Ton lots	Cast	Turnings	Distilled
	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

## Ferrovandium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primos)	3.20-3.25

Alisfer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

\$1.15

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	\$4.90
Less ton lots	4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta

\$3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo

\$1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton

\$65.00

10 tons to less carload

\$75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

\$1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

\$1.50

Less ton lots

1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton

\$177.00

Ferrotungsten, 14 x down, packed, per pound contained W, ton lots, f.o.b.

\$4.45

Molybde oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.

\$1.14

bags, f.o.b. Washington, Pa., Langeloth, Pa.

\$1.12

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.30¢

Vanadium Pentoxide, 86-89% V<sub>2</sub>O<sub>5</sub> contract basis, per pound contained V<sub>2</sub>O<sub>5</sub>

\$1.20

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots

\$1.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk

7.00¢

## Boron Agents

Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4% Si, 40-45%, per lb contained B...

\$5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots, per pound	10.00¢
---------------------	--------

Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots...

\$1.30

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 10% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	\$1.00
No. 6	65¢
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots	\$1.46
Less ton lots	1.57

Nickel-Boron, 15-18%, B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered

\$1.30

Silicax, contract basis, delivered.

Ton lots	45.00¢
----------	--------



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We can be your mill source for

# LARGE ROUNDS

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OWENSBORO, KENTUCKY

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### PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can perforate almost any size perforation in any kind of metal or material required. Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

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TIN, STEEL, COPPER, ALUMINUM, BRONZE,  
BRASS, ZINC, ANY METAL, ANY PURPOSE

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### COLD ROLLED STRIP STEEL

1/2" to 19" Wide  
.002 to .500 Thick

Desired quality for  
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strip steel requirements.

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BERT, 323 Huntington Ave., Buffalo,  
N. Y.

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good machinery

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to exacting standards

18" x 54" centers MONARCH Lathe, motor in base, taper attachment, chucks  
27" x 12' centers LODGE & SHIPLEY Selective Geared Head Lathe, AC-MD  
28" x 15' centers BERTRAM (Niles patterns) Timesaver Engine Lathe, 2 carriages, rapid traverse, AC-MD, 1943  
36" x 12' centers AMERICAN Heavy Duty 16 Speed Geared Head Lathe, AC-MD  
42" x 96" centers NILES Timesaver Heavy Duty Lathe, 42" swing over ways, rapid traverse, anti-friction head, AC-MD  
60" x 20' NILES BEMENT POND Geared Head Engine Lathe, rapid traverse  
No. 3A WARNER & SWASEY Turret Lathe, 6 1/4" hole in spindle, bar feed, chuck, tooling, new 1942  
62" BULLARD Vertical Boring Mill, 2 swivel rail heads, power rapid traverse, AC-MD  
No. 2 CINCINNATI Universal Dial Type Mill, dividing heads, high speed vertical attachment, 1944  
No. 2 CINCINNATI Vertical Mill, dial type, new 1945  
No. 3-24 CINCINNATI Plain Hydromatic Mill, AC-MD  
No. 4 KEARNEY & TRECKER Plain Horizontal Mill, No. 50 taper, motor in base, rapid traverse  
No. 4 CINCINNATI High Power Vertical Mill, No. 50 taper, power rapid traverse, AC motor  
No. 4H KEARNEY & TRECKER Vertical Mill, new 1944  
25A HEALD Rotary Surface Grinder, 24" diameter magnetic chuck, AC-MD  
No. 6G SELLERS Drill Grinder, new 1941  
36" OHIO Heavy Duty V Ram Shaper, new 1944, AC-MD  
1 1/2" LANDIS Bolt Threader, leadscrews, AC-MD  
75 Ton HENRY & WRIGHT Double Crank Dieing Machine, roll feed & scrap cutter  
600 Ton CHAMBERSBURG Wheel Press, cast steel frame, inclined, AC-MD  
30" MORTON, Hydraulic Keyseater, new 1942  
Type "D" BARBER COLMAN Gear Hobber, new 1945, practically new  
48" x 48" x 10' NILES Double Housing Planer, 2 rail heads, 1 side head, power rapid traverse

**O'Connell**  
MACHINERY CO.,  
of BUFFALO, n. y.  
1693 GENESEE ST.

## The Clearing House

NEWS OF USED AND REBUILT MACHINERY

New president of the Machinery Dealers National Assn., elected at the group's annual convention in Cleveland, June 8-11, is Richard Nathans, Kings County Machinery Exchange, Brooklyn.

Other new officers elected were: Benjamin Weiss, Machinery Liquidating Co., Detroit, second vice-president, and Robert Rice, Robert W. Rice & Co., Inc., treasurer. Thomas O'Brien, O'Brien Ma-

chinery Co., Philadelphia, continues as first vice-president.

Growth of MDNA during the last year proves the effectiveness of efforts by Randy Vinson, executive secretary, and local chapters to make the organization stronger. At last year's convention, the membership list covered seven chapters, with members from 177 companies. The latest listing includes nine chapters and 213 member firms.



SOME OF THE LUMINARIES attending the Machinery Dealers National Assn. annual convention earlier this month were: (Standing, l to r) Elmer Pfeil, convention co-chairman; Commander Arthur Johnson, NPA; Cy Zvonar, chairman, Milwaukee Chapter; Emil Stern, Detroit chairman; Earle Wade, Cleveland chairman; Charles McDonald, Sr., St. Louis chairman. Seated: Robert Rice, outgoing Chicago chairman and newly elected MDNA vice-president; Sam McClennen, outgoing Philadelphia chairman; Joseph Weiss, last year's MDNA president; Swan Bergstrom, president, NMTBA; and Randy Vinson, MDNA executive director.



GETTING THE TOOL BUILDERS' SLANT on business from NMTBA head Swan Bergstrom (center) were Sam McLennen Delta Equipment Co. (left), and Ralph Hochman, Ralph Hochman Co.



MIDWESTERN USED MACHINERY DEALERS talked shop between convention sessions (l to r): Aaron Pinkert, A. L. Bechtel, Leonard Graff, Alex Petrus, and J. R. Richards.

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*replaces*

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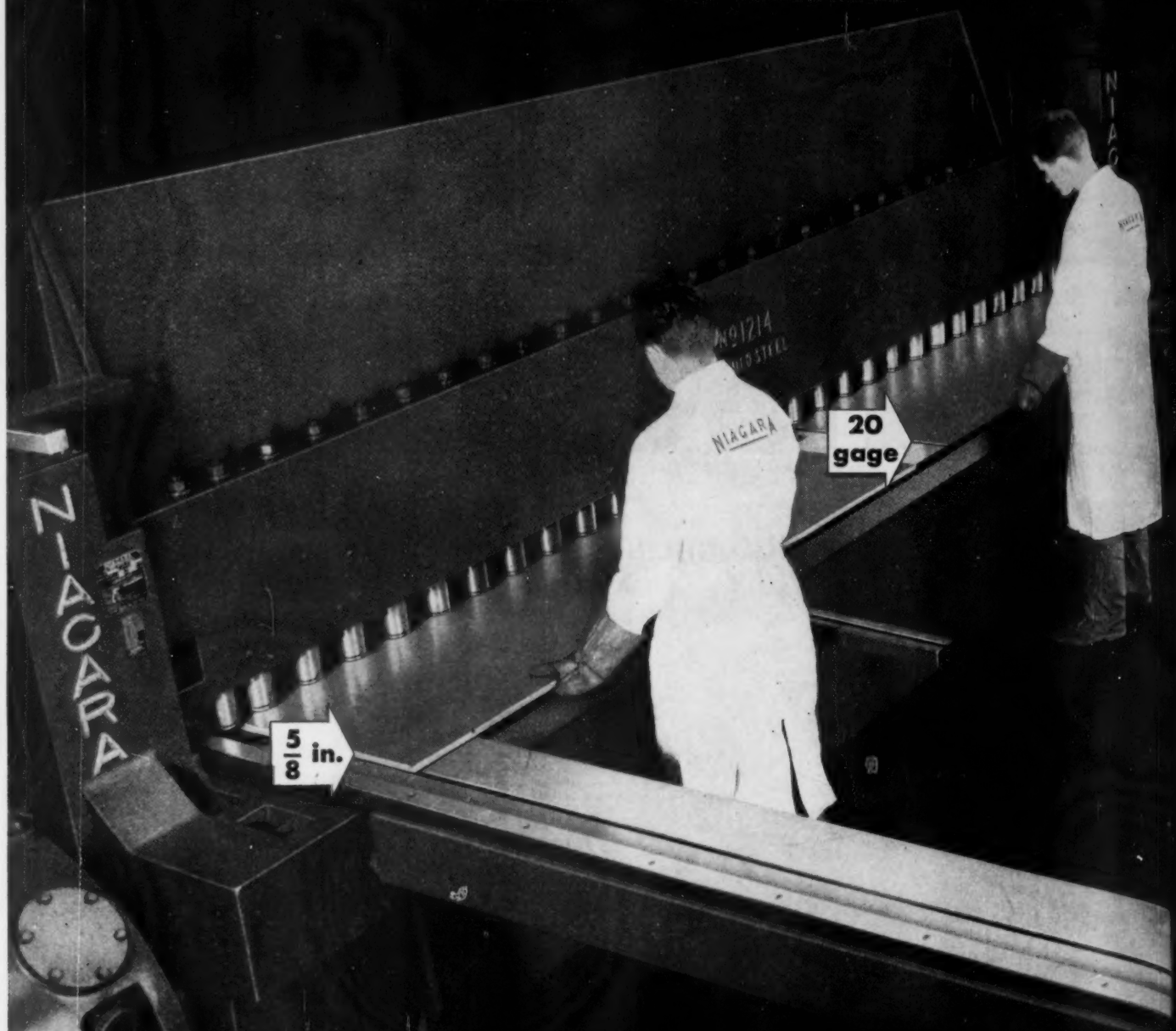
Address \_\_\_\_\_

June 25, 1953

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# CUTTING 20 GAGE and $\frac{5}{8}$ " PLATE SIDE-BY-SIDE AT ONE STROKE



*Photograph shows operators cutting  $\frac{5}{8}$ " plate and 20 gage sheet steel simultaneously on NIAGARA Power Squaring Shear. No change in knife adjustment is necessary.*

The ability of Niagara Power Squaring Shears to cut thick and thin plate both at the same time with the same-knife setting is a dramatic demonstration. Visitors at our plant can see this done every day. There is no necessity for tinkering with the knife adjustment.

*Demonstrates The Sound  
Engineering Design of*

**NIAGARA**

**POWER SQUARING SHEARS**

● There is no compromise with sound, proven engineering when it comes to NIAGARA shear design and construction.

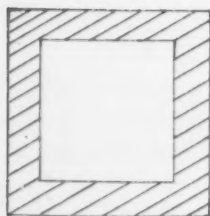
Accurate cutting depends primarily on rigidity of the shear's components.

For bed, crosshead and holddown NIAGARA uses CLOSED BOX SECTIONS to resist with minimum deflection the horizontal, vertical and diagonal or torsional loads to which every shear is subjected.

**NO OTHER SECTION WILL DO THIS JOB AS EFFICIENTLY.**

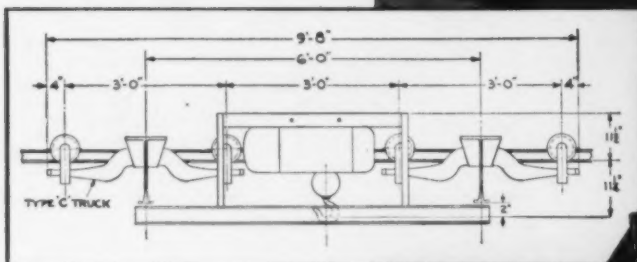
Angle or channel shaped sections have long since been abandoned for use on NIAGARA Power Shears.

The economy of quality is remembered long after price is forgotten.

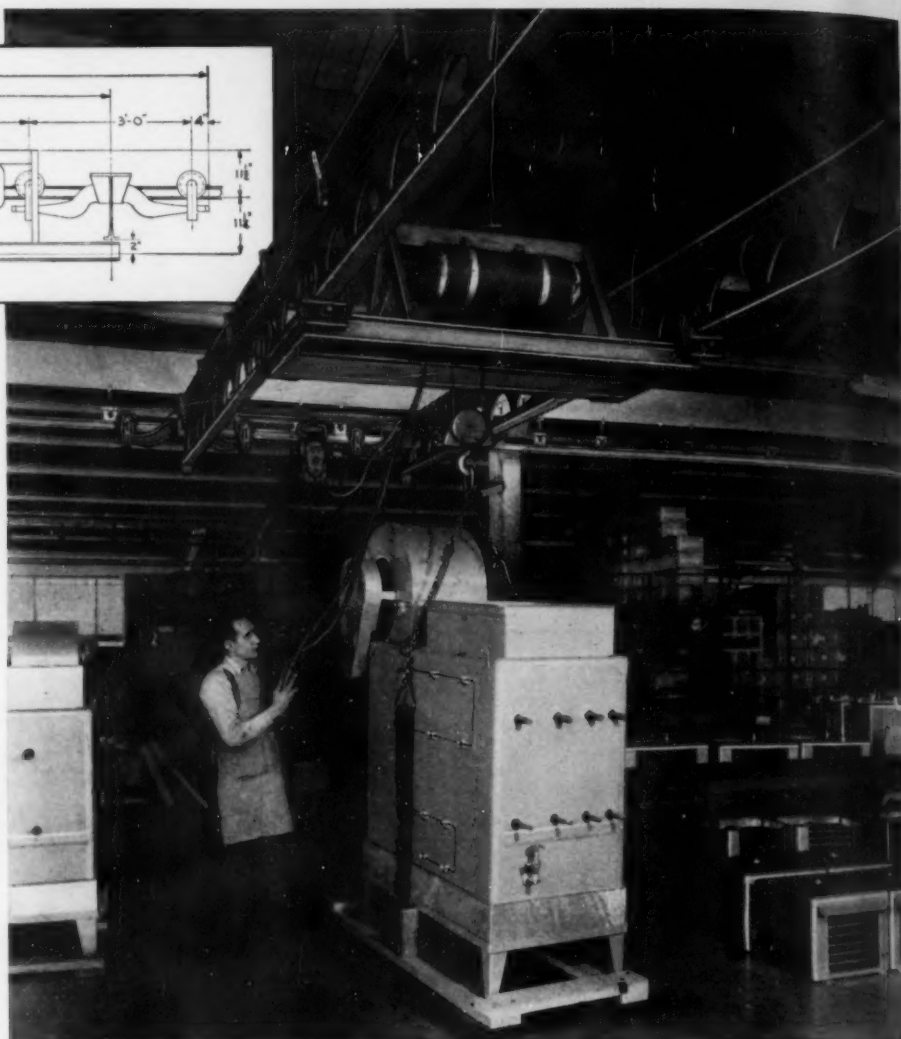


**BED, CROSSHEAD & HOLDDOWN DESIGN**

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, NEW YORK  
DISTRICT OFFICES: DETROIT, CLEVELAND, NEW YORK



Lifting this three-ton condenser and moving it about is made an easy one-man job with the Tramrail crane.



## HIGH LIFT UNDER LOW ROOF *Solves Handling Problem*

A double-girder, high-lift Cleveland Tramrail crane proved the solution of a handling problem at The Refrigeration Engineering Co., Los Angeles, Calif., manufacturers of evaporators and condensers of all sizes up to 100-ton rating.

Because many of their units are high and heavy, and the roof is very low, it was necessary to develop a special crane design that permits utilizing space between the crane girders. How

well this was engineered is evidenced by the fact that while the distance from floor to the low part of the roof truss is only 11'-10 1/4", the hoist hook can be raised 10'-0" above the floor.

The crane and hoist are motor-driven, push-button controlled. The trolley is hand-propelled. The hoist has a capacity of three tons and travels at 18 feet per minute.



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**CLEVELAND  TRAMRAIL**  
OVERHEAD MATERIALS HANDLING EQUIPMENT



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switch  
is to  
**STAINLESS-  
CLAD  
PLATES**

for lower costs...

extension of material supplies

More and more, economy-minded buyers are switching to Stainless-Clad Steel Plates as an effective means of extending supplies of critical materials and of beating the high cost of stainless steel.

They find that in numerous types of fabrication these plates give them all the advantages of stainless steel, including high resistance to corrosion—yet with considerable savings in material costs.

Stainless-Clad Plates made by Claymont are a composite of stainless steel permanently bonded to carbon or alloy steel plate. They're easy to fabricate; will not buckle, crack or peel under the severest forming operations. Stainless cladding may be of any specified percentage of total plate from 10% to 50%.

Other Claymont products include Flanged and Dished Heads, Alloy and Carbon Steel Plates, Large Diameter Welded Steel Pipe.

To order, write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado

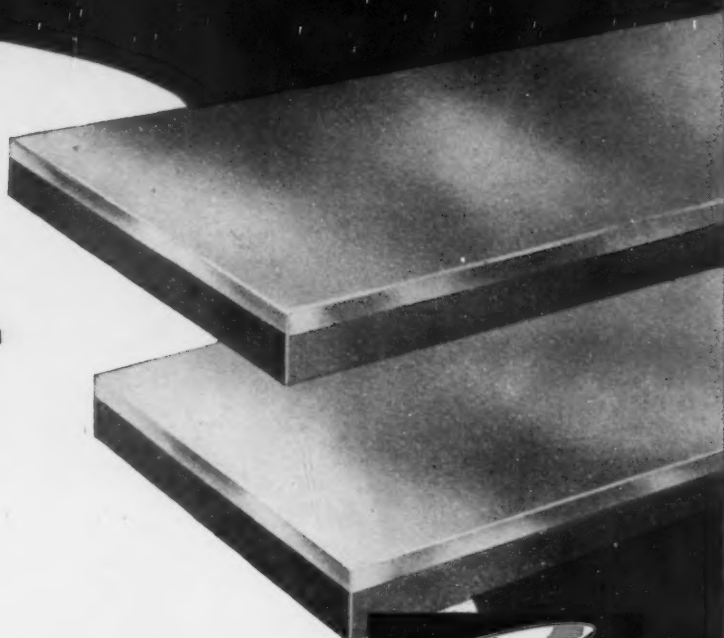
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PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION  
THE COLORADO FUEL AND IRON CORPORATION



Flanged and Dished Heads



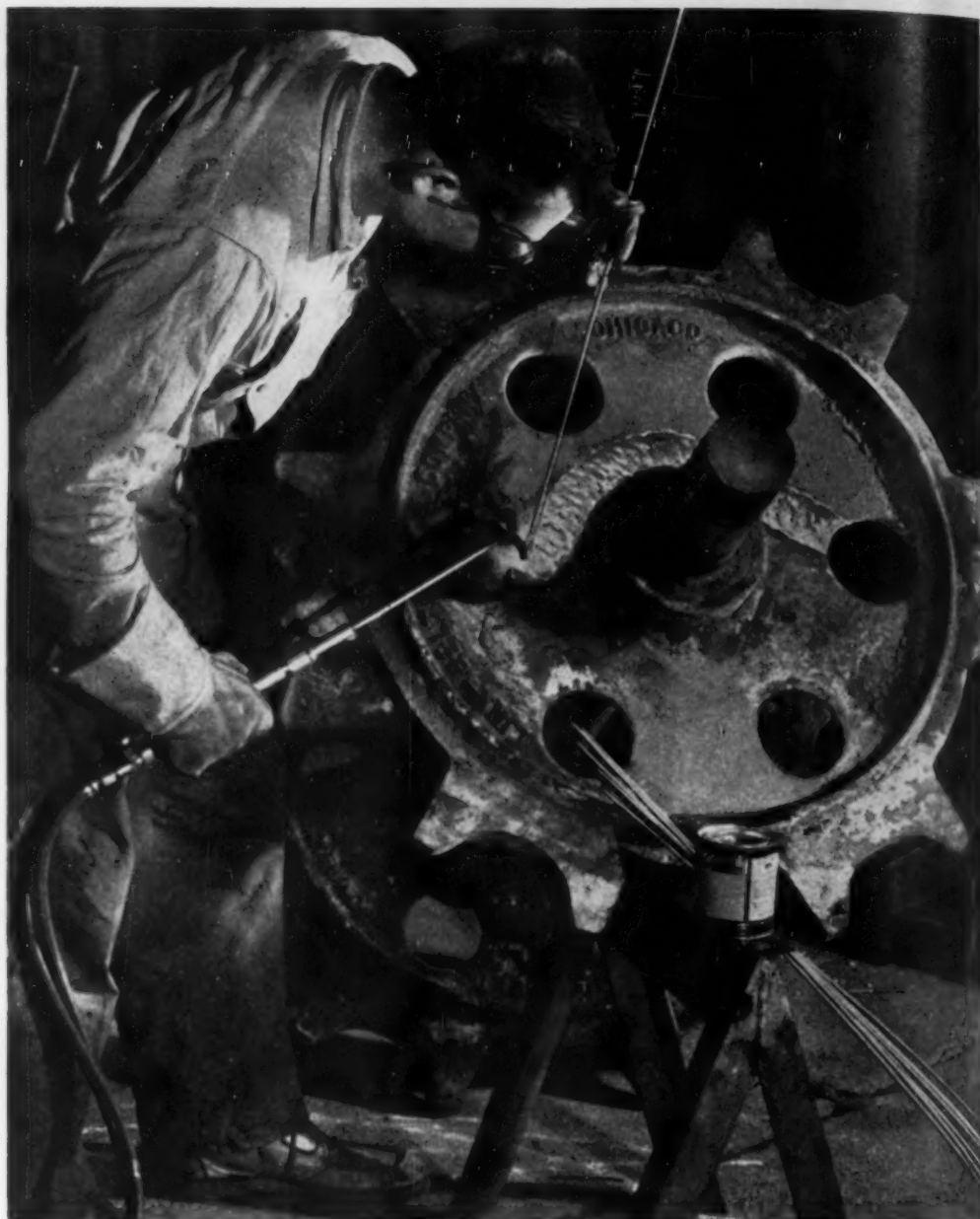
Carbon and Alloy Steel Plates



Large diameter steel pipe

## BRAZE WELDING

**CONVEYOR DRIVE SPROCKET** that was repaired by braze welding with ANACONDA-997 (Low Fuming) Bronze Rods in only 7 hours. Braze welds made with these rods are clean and strong . . . require little finishing.



# SAVED: one expensive drive sprocket *plus* 53 operating days

Replacement of this fractured conveyor drive sprocket would have meant a two-month wait for delivery . . . and considerable expense to its smelting-plant owners. An inexpensive braze-weld repair had it back in operation in a matter of days. Job time was only 7 hours—4 in preparation, 3 in welding. Twenty pounds of  $\frac{3}{16}$ " and  $\frac{1}{4}$ " ANACONDA-997 (Low Fuming) Bronze Welding Rod were used.

Owner Walter Shanowsky, Universal Welding Co., Rochester, N. Y., reports that ANACONDA-997 (Low-Fum-

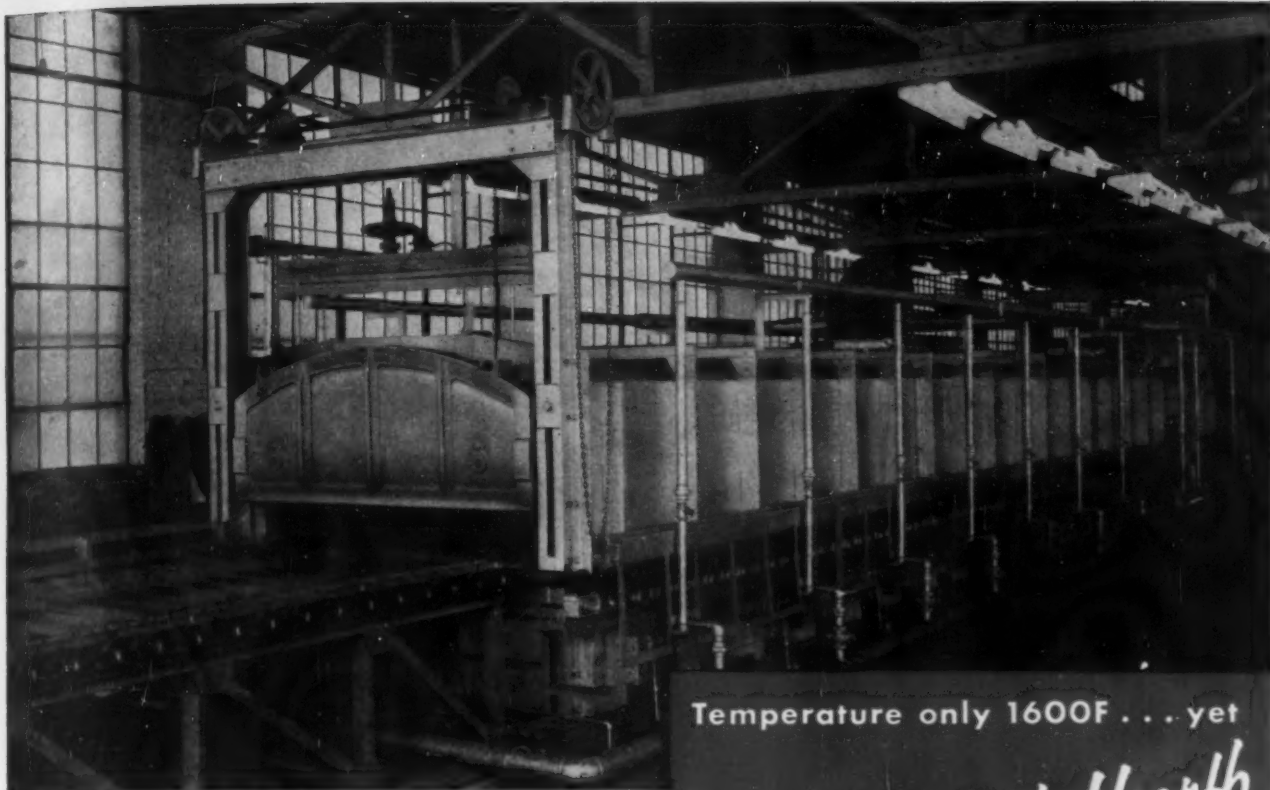
ing) Bronze Rod gave a fast, sound weld. These rods 'tin' readily, flow freely and have good tensile strength. They melt at relatively low temperatures . . . work requires less preheating, so danger of warping or cracking is minimized.

Universal buys all its ANACONDA Welding Rods from the Welding Supply Corp. in Rochester. ANACONDA Welding Rods for almost every type of repair and production job are available from distributors throughout the United States and Canada. For latest

tips on welding, write for Publication B-13 to: *The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.* 53196

**braze or weld with confidence...**

**ANACONDA<sup>®</sup>**  
**welding rods**



These armor-plate hardening furnaces, built by The Drever Co. of Philadelphia, Pa., range from 40' to 60' long, by about 7' wide. There are seven furnaces like this operating at various plants. Each is equipped with a CARBOFRAX hearth. Average hearth life ranges from 18 to 36 months, depending on tonnage handled.

**Saves fuel . . . Heats more rapidly, and uniformly**

This is a continuous roller-hearth hardening furnace, used for treating armor plates (up to 6' wide, up to 20' long, and in varying thicknesses up to 3"). It is under-fired with oil and/or gas to a chamber temperature of 1600 F. The work is carried on metal rollers over a hearth made of CARBOFRAX silicon carbide tile.

It is interesting that CARBOFRAX refractories were selected even though two of the outstanding properties of this material — its resistance to high temperatures and abrasion — are not brought into play. The reason for their selection, of course, lies in the tremendously rapid thermal conductivity of CARBOFRAX refractories. They conduct heat 11 to 12 times faster than fireclay. The result is a far more

Temperature only 1600F . . . yet

*Silicon Carbide Hearth Proves Best*

efficient furnace; one that heats uniformly, and can be closely controlled. It also takes less fuel — and the refractories are exceptionally long lasting.

This application brings home another point — i.e. not all silicon carbide refractories are the same. Other brands have been tried in similar furnaces, but due to premature oxidation, could not approach the life of these CARBOFRAX hearths.

**Why Not Check Up?** Chances are, your furnaces can be impressively improved by super refractories by CARBORUNDUM. Write or phone us today. Product data promptly furnished. Address: Dept. B-63, Refractories Division, The Carborundum Company, Perth Amboy, New Jersey.

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Trade Mark

"CARBORUNDUM" AND "CARBOFRAX" ARE REGISTERED TRADEMARKS OF THE CARBORUNDUM CO. — WORLD'S LARGEST MANUFACTURER OF SUPER REFRACTORIES

June 25, 1953

43





**pick the stainless  
that fits best**

When selecting stainless steel be sure you pick the correct type for your particular application. For some grades resist corrosion better . . . others have superior heat resistant properties. Some are easier to machine . . . still others can be more readily formed or welded.

In every case there is a grade of Crucible REZISTAL Stainless Steel that is best suited to the job. And to help our customers select the type that will provide the best service for the lowest cost, we make available all the design, metallurgical, fabricating and application data we have accumulated in our years of stainless steel experience with many different industries.

Our staff of field representatives brings you the benefit of our vast technical resources. And the quality of REZISTAL Stainless Steel sheets, strip, plates, bars, wire, forgings, castings and tubing produced in our modern integrated mills is unsurpassed in the industry. When you have an application for stainless, call Crucible.

**CRUCIBLE**

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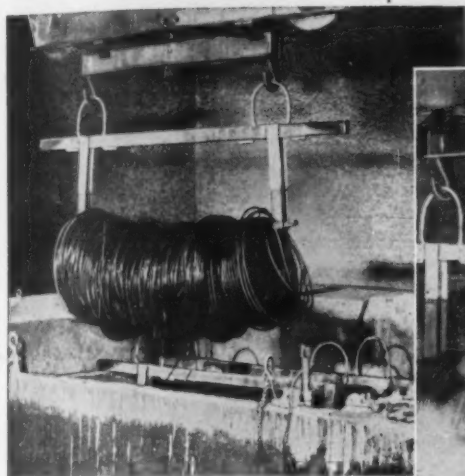
53 years of *Fine* steelmaking

**STAINLESS STEEL**

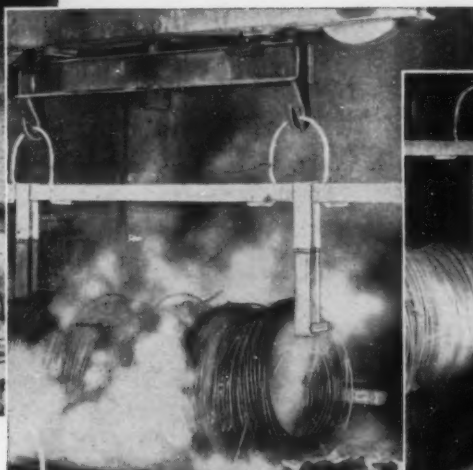
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STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

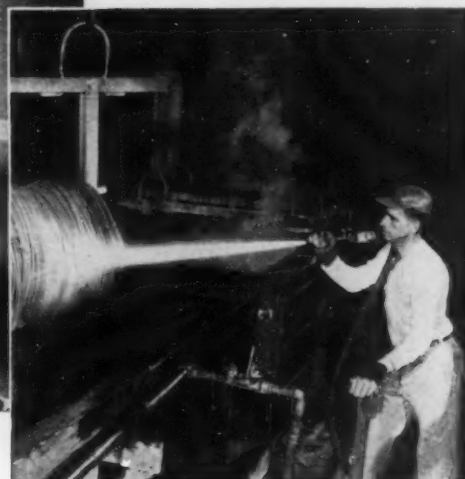
# Over 5 tons of carbon steel wire thoroughly descaled within one hour!



A yoke of 5/32" dia. wire is lifted from the hydride tank. (Up to 3 yokes can be treated at one time in this tank. Working dimensions are 7' x 8' x 5' 6".)



Water quench blasts off loosened scale.



Thorough descaling complete with final rinse.

## DU PONT SODIUM HYDRIDE DESCALING PROCESS

By switching to Du Pont's efficient and simplified process, a large eastern steel manufacturer was able to triple descaling capacity—with *less than half* the man power!

These and other important savings are possible with Sodium Hydride Descaling because elaborate scale breaking operations are eliminated entirely, yet uniform descaling is accomplished in the shortest possible time—no retreatments needed! And because dissimilar metals can be effectively treated in the same bath, this steel mill finds the Du Pont process ideal for descaling their quality carbon and stainless steel products indiscriminately at production line speeds.

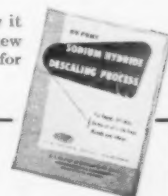
Costly rejects due to pitting or loss of gauge are avoided . . . there's never any danger of base metal

attack no matter how long the work remains in the sodium hydride bath! Dimensional accuracy is maintained, and subsequent drawing operations can be carried out to closer tolerances. Die life, too, is increased.

Find out how Du Pont's Sodium Hydride Process can improve your descaling operations. Just get in touch with our nearest district office or send in the coupon below.

**DISTRICT AND SALES OFFICES:** Baltimore • Boston • Charlotte • Chicago  
Cincinnati • Cleveland • Detroit • Kansas City\* • Los Angeles • New York  
Philadelphia • Pittsburgh • San Francisco. \*Baroda & Page, Inc.

*More detailed information* about the process—how it works, what it can do for you—can be found in our new book. Call our nearest office or use the coupon below for your copy.



### DU PONT Sodium hydride process for positive descaling



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Electrochemicals Department IA-625  
Wilmington 98, Delaware

Please send me more information about the Du Pont Sodium Hydride Descaling Process: advantages, applications, equipment used. I am interested in descaling\_\_\_\_\_

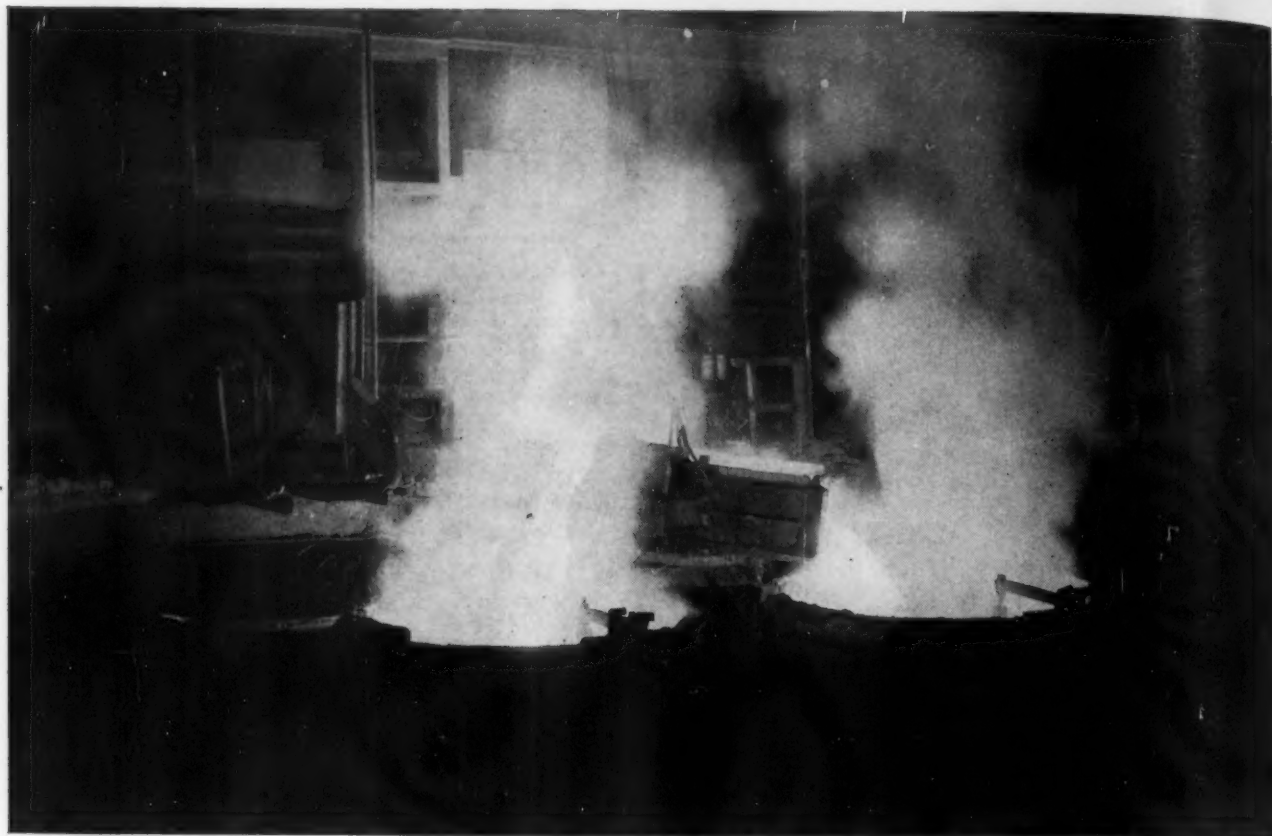
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June 25, 1953



PHOENIX IRON & STEEL COMPANY, Phoenixville, Pa., is one of the nation's oldest steel producers. Above, Phoenix open hearth furnace being tapped by bazooka gun.

## Steel, anyone?

Or, for that matter, aluminum, Fiberglas, magnesium?

Name a basic material on industry's shopping list and chances are that one of Barium's 16 integrated companies has a hand in its production or fabrication.

No other steel producer fabricates so many different products. No other processor can match Barium's ability to turn magnesium, the versatile sea-born metal, into basic structural forms. Barium specialists are also breaking new ground in the utilization of Fiberglas for structural appli-

cations, such as aircraft shelters and barges.

This close-knit and fully integrated organization of 16 companies offers you a wealth of top-rank engineering talent and extremely flexible production facilities. They can take excellent care of your requirements for structural and fabricated materials, whether routine or highly specialized. We'll be glad to tell you how. Just drop a line on your company letterhead direct to Barium Steel Corporation, 25 Broad Street, New York 4, N. Y.



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INDUSTRIAL FORGE & STEEL, INC., Canton, O., one of the nation's largest producers of heavy flat-die forgings, works in all types of steels and other metals. Here, titanium is being forged.



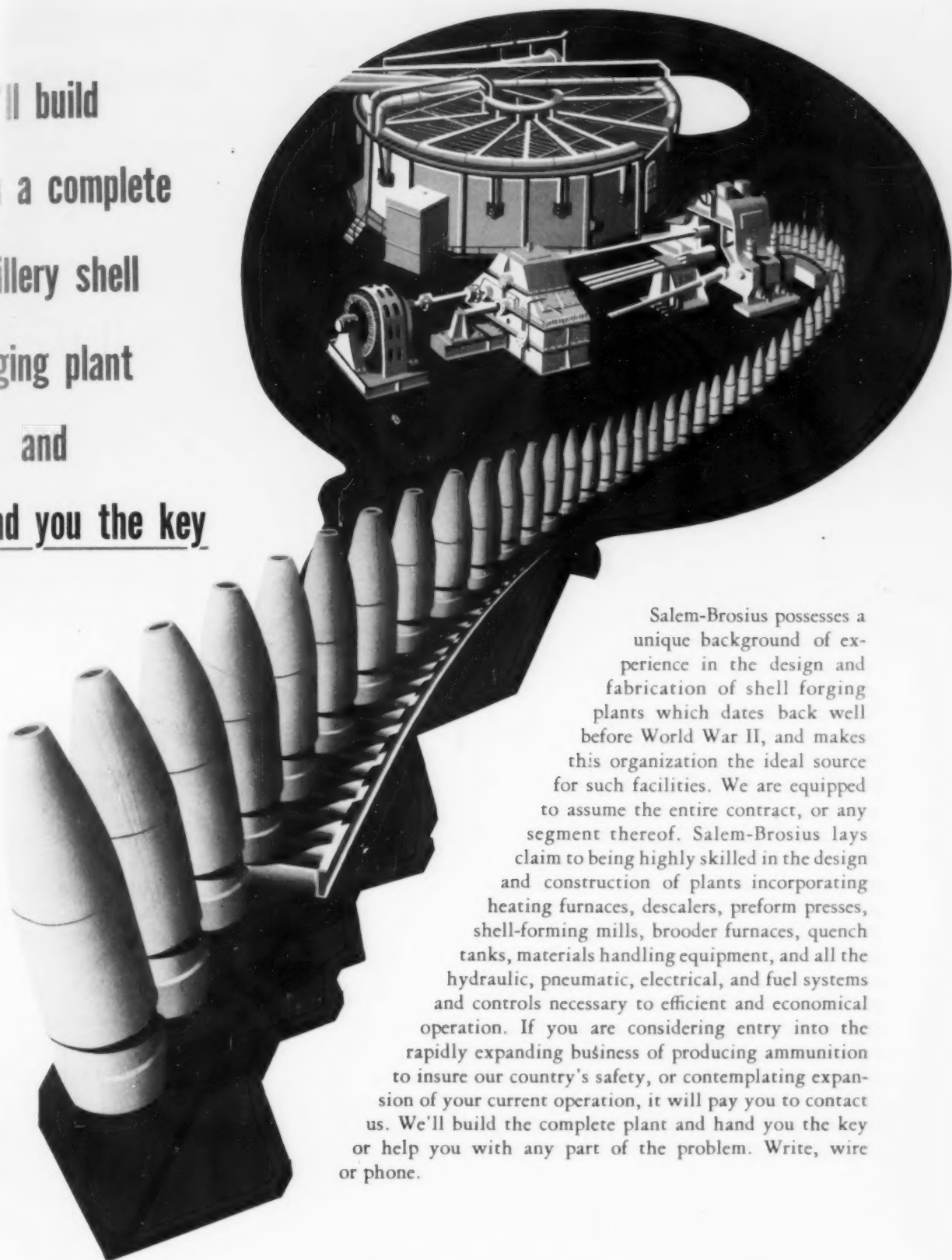
AT 60° BELOW, this air-borne Fiberglas-and-magnesium alert shelter protects planes and crews. Designed and built by Barium's East Coast Aeronautics, Inc., Pelham Manor, N. Y.



DOUBLE CHECK is given a radiator support for an Army truck by inspectors at Geometric Stamping Co., Cleveland, O., which turns out steel and aluminum stampings for industry.



We'll build  
you a complete  
artillery shell  
forging plant  
and  
hand you the key

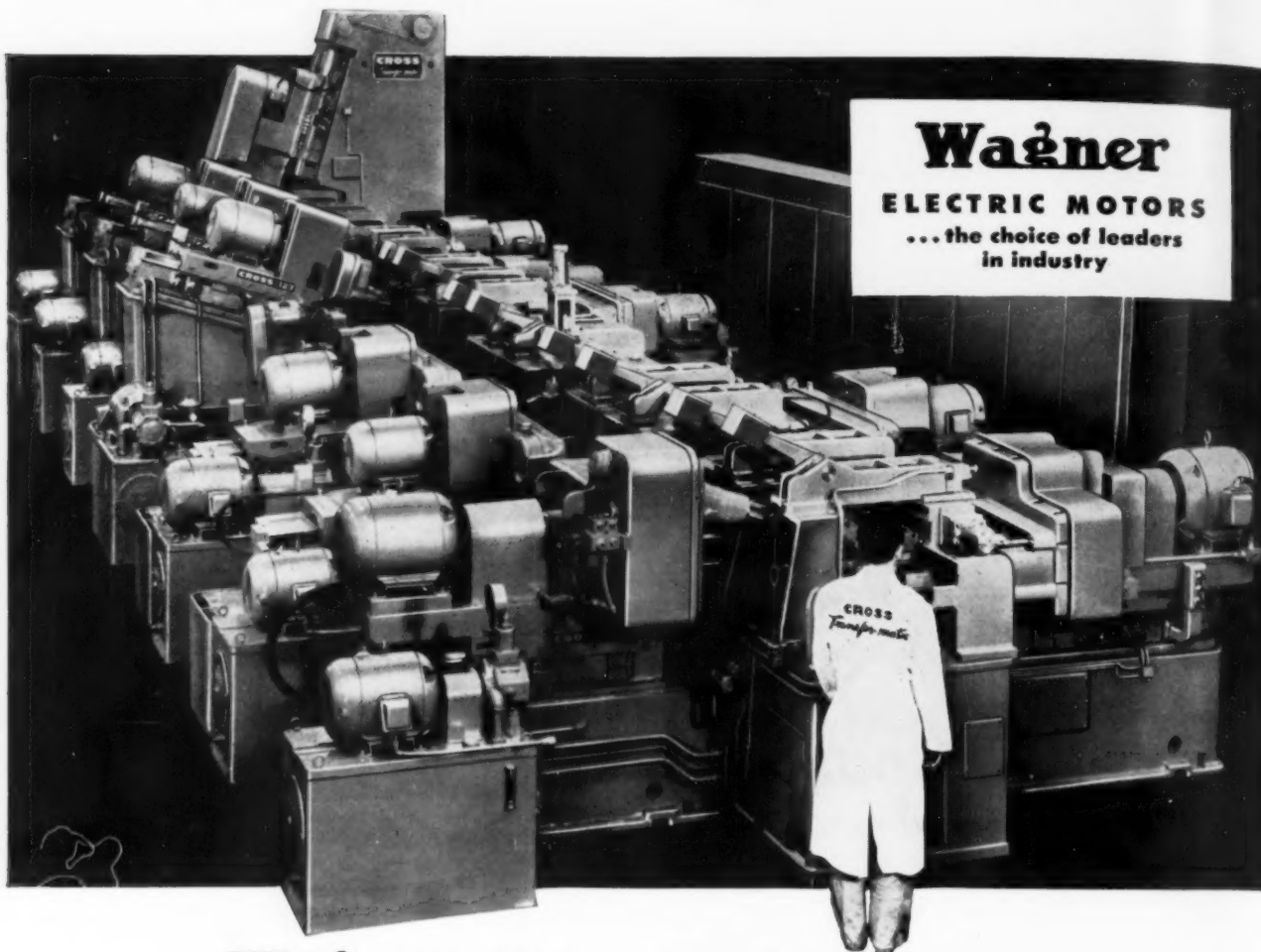


Salem-Brosius possesses a unique background of experience in the design and fabrication of shell forging plants which dates back well before World War II, and makes this organization the ideal source for such facilities. We are equipped to assume the entire contract, or any segment thereof. Salem-Brosius lays claim to being highly skilled in the design and construction of plants incorporating heating furnaces, descalers, preform presses, shell-forming mills, brooder furnaces, quench tanks, materials handling equipment, and all the hydraulic, pneumatic, electrical, and fuel systems and controls necessary to efficient and economical operation. If you are considering entry into the rapidly expanding business of producing ammunition to insure our country's safety, or contemplating expansion of your current operation, it will pay you to contact us. We'll build the complete plant and hand you the key or help you with any part of the problem. Write, wire or phone.

# *SALEM-BROSIUS, INC.*

Sales and Executive Offices: 248 Fourth Avenue, Pittsburgh 22, Pa.

Brosius Division, Pittsburgh 15, Pa. • Salem Engineering Division, Salem, Ohio



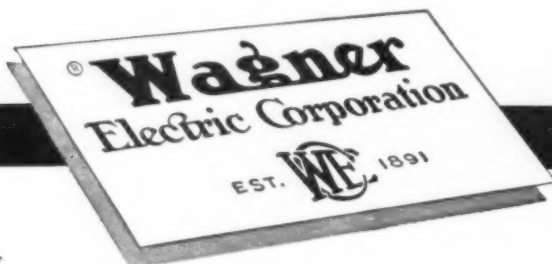
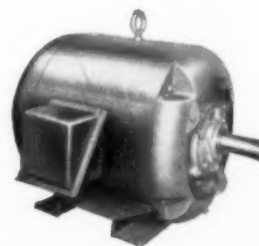
## Wagner Motors provide the power to machine 72 tractor cylinder blocks per hour

This Cross Transfer-matic was built for Ford Motor Company for use in its Tractor and Engine Division. It mills, drills, bores, taps, reams and chamfers 72 tractor cylinder blocks in an hour, and is equipped throughout with Wagner totally-enclosed motors. (A total of 32 motors, ranging from  $\frac{1}{4}$  to 15 hp.)

Machine tools powered with Wagner totally-enclosed motors are assured freedom from excessive downtime caused by motor failure, because these motors are fully protected against damage from steel-filings, chips, dust, dirt, fumes and moisture.

For your requirements, there is a Wagner Motor to fit every need—a complete line for all current specifications, with a wide variety of enclosure types and mountings. Bulletin MU-185 gives full information. Do you have a copy?

A nearby Wagner engineer will be glad to help you select the *right* motors for your next application. Consult the nearest of our 32 branch offices, or write us.



**WAGNER ELECTRIC CORPORATION**  
6403 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES  
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

M53-17

**Packed in Bags and Shipped on Pallets**

Each bag holds 25 lb. of contained vanadium, so additions can be made without weighing. Bags prevent contamination and are shipped on pallets for easy and economical handling.



# Use this New, Easy Method



## ... FOR ADDITIONS OF VANADIUM

You can handle additions of vanadium conveniently and economically with ELECTROMET ferrovanadium packed in bags.

Check these advantages:

- **Convenient Packaging**—The alloy is packed in strong five-ply, paper bags. These bags have a wide blue band across the middle, as well as blue edges and bottom, for positive identification. The bags prevent contamination and preclude any chance of mix up with other alloys.
- **No Weighing**—Each bag (25 lb. of contained vanadium) can be added without weighing.
- **Handling Costs Reduced**—Pallet shipments are available at no extra charge. Each pallet holds about 4,000 lb. of ferrovanadium—2,200 lb. of contained vana-

dium. Pallets can be conveniently unloaded and handled in your plant by lift truck or overhead crane. Handling costs are reduced and inventory-taking is simplified. And you don't have to return the pallets.

- **High-Quality Material for Every Need**—ELECTROMET ferrovanadium is uniform in analysis, closely graded, correctly sized, and physically clean. It is furnished in four grades:

	Vanadium	Silicon max.	Carbon max.
High-Speed Grade	50 to 55%	1.50%	0.20%
Special Grade	50 to 55%	2%	0.50%
Open-Hearth Grade	50 to 55%	8%	3%
Foundry Grade	50 to 55%	approx. 10%	3%

- \* **Immediate Delivery**—Vanadium is readily available and can frequently be used in engineering steels to replace part, if not all, of certain scarcer alloys.

*The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.*

- \* **Engineering Service**—Our staff of experienced metallurgical engineers is always ready to furnish technical assistance in the use of vanadium. Phone, wire, or write one of ELECTROMET's offices for additional information.

### ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street **UCC** New York 17, N. Y.

OFFICES: Birmingham • Chicago • Cleveland • Detroit  
Houston • Los Angeles • New York • Pittsburgh • San Francisco

In Canada: Electro Metallurgical Company of Canada, Limited,  
Welland, Ontario

# Electromet

TRADE-MARK

## Ferro-Alloys and Metals





## Handclasp of a friend-in-need

There's confidence in the very "feel" of the world famous C-O-TWO Squeeze-Grip Carbon Dioxide Type Fire Extinguishers. The quick-acting "Squeeze-Grip" fits your hand naturally like a handclasp...hangs right...carries right...works right. You're in complete command of the situation instantly...no fumbling...no fatigue.

From the non-conducting, shatterproof discharge horn to the high strength, durably finished cylinder, you get top quality construction that results in a lifetime of satisfactory service. Because of the very few working parts and corrosion resistant materials throughout, the total cost to you over the years is less than other initially lower priced makes...fire after fire, recharge after recharge, without trouble.

It's not hard to see, when you fully compare and try, why C-O-TWO Squeeze-Grip Carbon Dioxide Type Fire Extinguishers

are your best buy for killing flammable liquid and electrical fires, as well as some surface fires involving ordinary combustible materials. Sizes range all the way from 2½ to 100 pounds capacity...all fully approved by the Underwriters' Laboratories, Inc., Factory Mutual Laboratories, Armed Forces and Government Bureaus.

With C-O-TWO Squeeze-Grip Carbon Dioxide Type Fire Extinguishers the penetrating carbon dioxide is a clean, dry, non-damaging, non-conducting, inert gas...smothers fire instantly, leaves no after fire mess...harmless to equipment, materials and finishes...even food is still perfectly edible.

Act now for complete free information on these first-rate, sure-acting fire extinguishers. Remember fire doesn't wait...get the facts today!



MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeeze-Grip Carbon Dioxide Type Fire Extinguishers  
Dry Chemical Type Fire Extinguishers  
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems  
Built-In Smoke and Heat Fire Detecting Systems

### C-O-TWO FIRE EQUIPMENT COMPANY NEWARK 1 • NEW JERSEY

C-O-TWO FIRE EQUIPMENT OF CANADA, LTD. • TORONTO 8 • ONTARIO

Sales and Service in the Principal Cities of United States and Canada

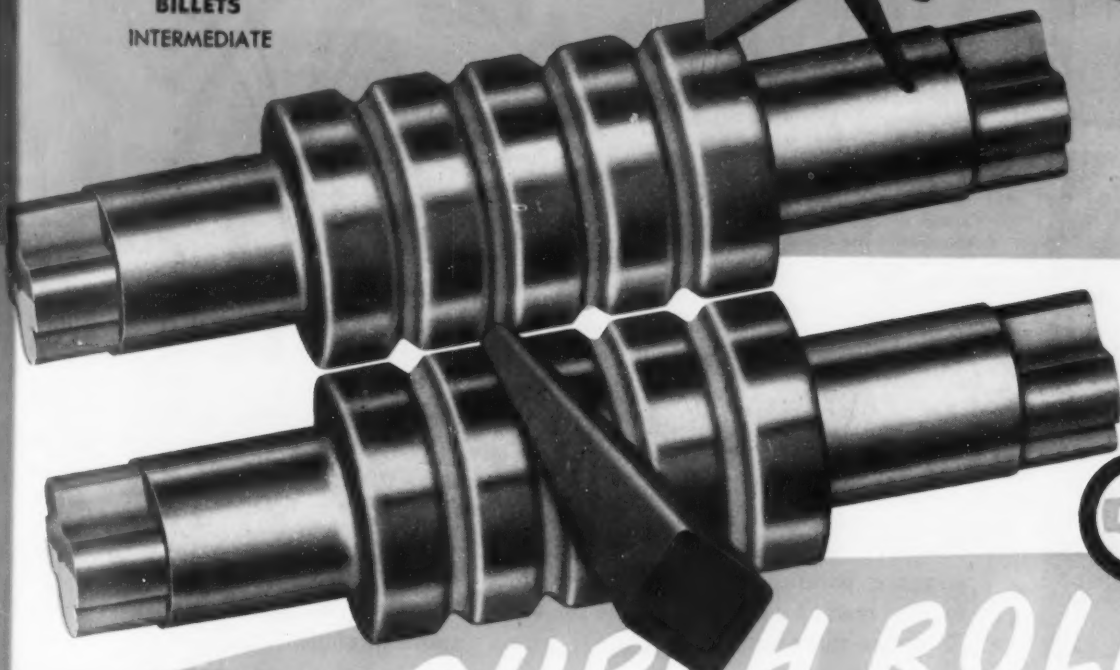
AFFILIATED WITH PYRENE MANUFACTURING COMPANY

PHOENIX METAL ROLLS are color  
marked for specific uses in rolling...



**ANGLES**  
INTERMEDIATE AND ROUGHING

**BILLETS**  
INTERMEDIATE



# PITTSBURGH ROLLS

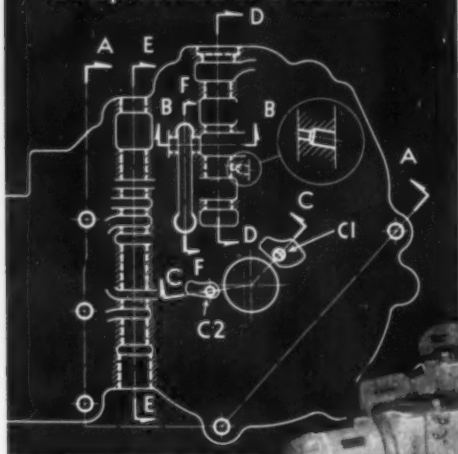
ROLLS DIVISION of BLAW-KNOX COMPANY • PITTSBURGH, PA.

## OTHER PITTSBURGH ROLL TYPES

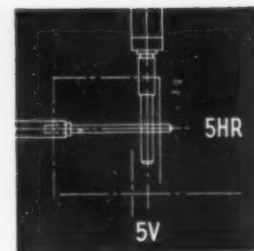
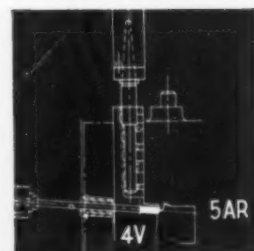
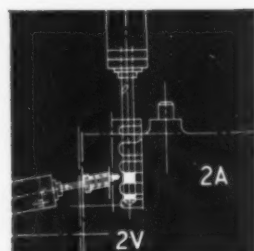
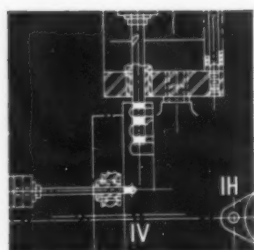
Chill  
Moly Chill  
Special Rail Finishing  
Phoenix "K"  
Pittsburgh Grade 25  
Pittsburgh Grade 35  
Pittsburgh Grade 45

Pittsburgh Grade 55  
Pittsburgh Grade Special Process  
Phoenixloy  
Phoenix Metal Master  
Phoenix "A" Alloy Steel  
Phoenix "A" Special Alloy Steel  
Carbon Steel

Transmission Valve Body 10 $\frac{1}{2}$ c each  
30 Operations in 6 sections



Kingsbury  
give you

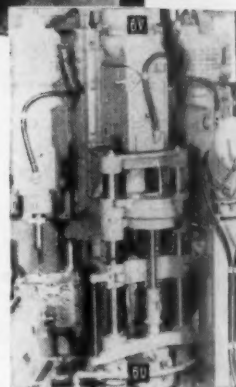


This Kingsbury central column machine has knees for mounting 3 Horizontal (H) Units and 8 Angle (A) Units. The central column mounts 11 Vertical (V) Units, one of which has two heads, one above the work and the other under it (U). Some of the units have multiple spindles. The 60-inch index table

has 12 stations — one for loading and unloading.

The machine performs 30 operations: drilling, c'oring and reaming. Some of these are illustrated below.

This Kingsbury produces 176 pieces per hour gross at an average cost of 10.26¢ per piece.



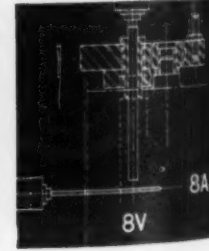
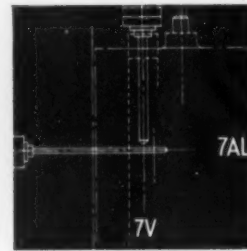
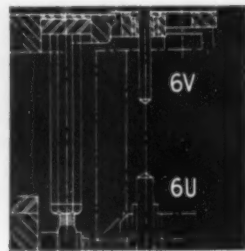
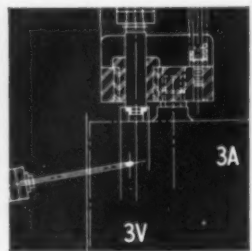
## Follow this Transmission Valve Body

*Section A:* Unit 1H .281 drill — 5 thru-holes.

*Section DD:* Five vertical and three angle units prepare this long valve hole thru five walls. It must be straight, accurate, parallel with Section EE, and finished ready for boring. Unit 1V .437 drills thru three walls; Unit 2V .437 drills

thru the fifth wall. Units 4V and 5V rough- and semi-finish step-ream the hole. Unit 3V step-c'bores .812 and .640 at entrance to hole.

Angle units finish the port at the fourth wall. Unit 2A .156 drills  $\frac{15}{64}$  deep; Unit 3A .096 drills thru and Unit 10A .1115 reams this hole.





# Special Purpose Machines are custom-built to high production at low cost

Units of 1/2 to 5 hp drill, ream, c'bore, mill, tap, thread — all accurately and economically

Operations are combined to insure accuracy, speed production, save money. The piece is chucked only once. It travels through the machine cycle, stopping successively at stations where Kingsbury Units complete their operations within predetermined time limits. At some stations several units work on the piece simultaneously. The operator loads and unloads the machine — there is no rehandling. Accurate machining reduces scrap. And think of the floor space saved!

If you have a suitable piece which requires a combination of these machining operations, it will pay you to investigate a Kingsbury. We can tell you whether or not we could develop a machine to make the piece in quantity at satisfactory cost. In fact, we would not tackle the job unless we could!

Kingsbury Machine Tool Corp.  
102 Laurel Street, Keene, New Hampshire

## KINGSBURY

**AUTOMATIC DRILLING  
AND TAPPING MACHINES**  
for Low-Cost High Production

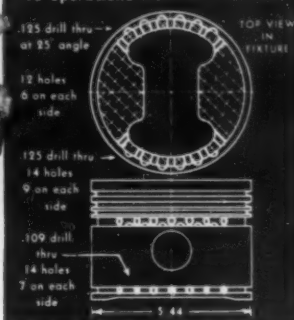


### Forged Aluminum Piston 60 Pieces per Hour Gross — 9-9/10¢ per Piece

This compact machine has a 60-inch base with 6 units mounted around a central work fixture. Operator loads the part, trips a valve and watches the machine go through an automatic cycle that takes 41 seconds.

The piston indexes on its own axis. First index 26° 15', then 5 indexes of 14° each to complete 12 angular holes in upper ring groove. Heads 1A & 4A do this work.

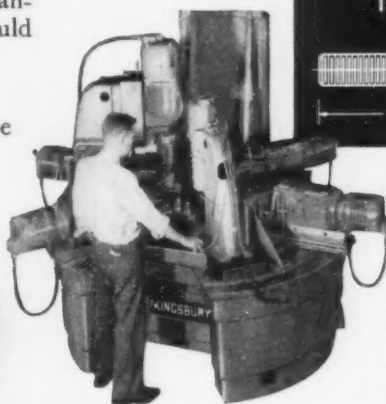
### Forged Aluminum Piston 9¢ per part 40 Operations from 40 directions



Next index 16° then 1 index of 18° and 5 indexes of 14° complete 14 horizontal holes in lower ring groove. Heads 3H & 6H do this work.

Next index 43° 30', then 6 indexes of 15° to complete 14 horizontal holes in upper ring groove. Heads 2H & 5H do this work.

Now index 26° 15' to bring work to loading position. Machine stops automatically, job is finished.



### Stainless Steel Bolt 1¢ per part 15 Operations from 7 directions



### Stainless Steel Bolt 460 Pieces per Hour Gross — 1-9/10¢ per Piece

On an 80-inch diameter base, four horizontal and two vertical units spot drill, drill thru, flat-bottom and burr-ream as required. The 12-inch index table has 12 work fixtures, and each rotates clockwise. Work fixtures rotate 90° when the table indexes 30°. Bushing carriers insure accuracy.

## through 30 operations — with only one chucking

Section EE is another long valve hole thru nine walls, prepared for boring. Vertical units perform 7 operations.

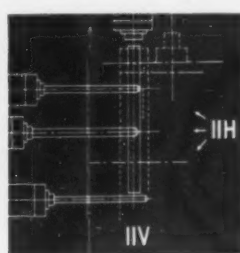
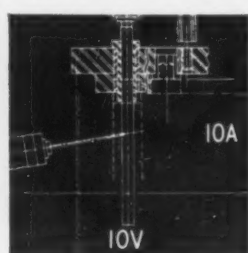
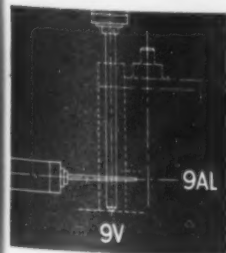
Unit 6V .422 undersize drills down thru two walls. Unit 6U .625 drills up thru ninth wall. Unit 7V .421 drills down thru three more walls. Unit 8V .4531 end-reams the hole

thru five walls. Unit 9V .453 drills the hole thru. Units 10V and 11V .4687 rough end-ream and .4882 semi-finish ream the hole.

Section FF: Unit at 11H drills .343 dia. and .281 dia. partial holes shown; and four .281 dia. holes not shown.

Section BB: Unit 5H Right .312 drill thru both walls.

Section CC: Unit 5A Right .218 drills hole C1 full depth. Four Units operate on step-hole at C2; Unit 5A Left .060/.065 drills thru; Unit 7A Left .156 drills 1 1/2 deep; Unit 8A Left .094 drill undersize, and Unit 9A Left .094/.096 reams the hole.



### Each Unit Cost on the drawings

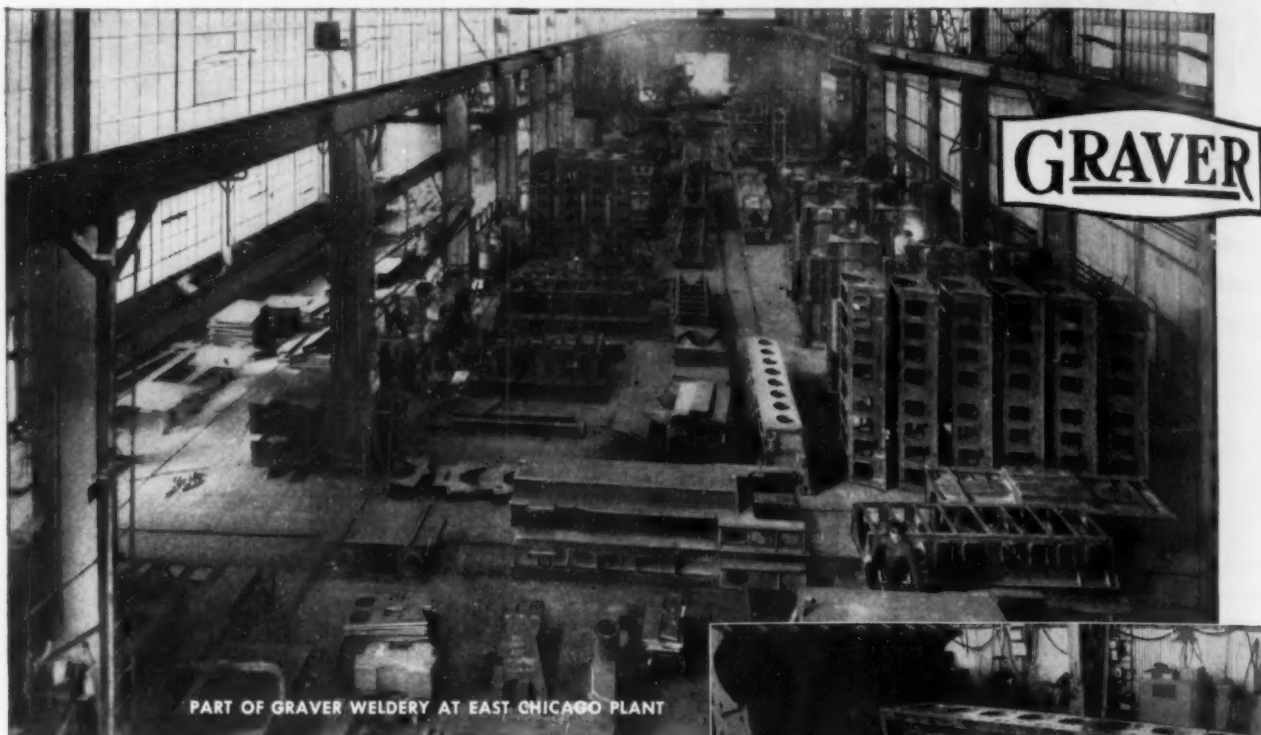
includes the cost of the man and of the machine — no power or overhead. We assumed:

Unit cost of man equal to:

average U. S. hourly wage  
hourly gross × 80% efficiency

Unit cost of machine to be:

price of tooled machine  
output in 6000 hrs. @ 80% efficiency



PART OF GRAVER WELDERY AT EAST CHICAGO PLANT

# WELDMENTS

in a wide range

by **GRAVER**

Manufacturers in the heavy industries field have for many years found Graver an excellent source for welded sub-assemblies. From Graver's well-equipped weldery has flowed a continuous succession of weldments for a wide range of industries. Pictured are examples of recent Graver work . . . mass-produced but expertly fabricated . . . with the special advantages secured through sub-contracting to Graver: economy in cost, rigid quality controls, creative engineering and sound welding research.

## **GRAVER TANK & MFG. CO., INC.**

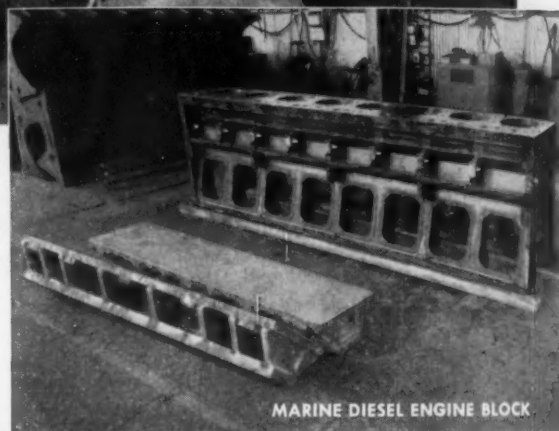
**EAST CHICAGO, INDIANA**

NEW YORK • PHILADELPHIA • CHICAGO

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SAND SPRINGS, OKLA. • ODESSA, TEXAS • CASPER, WYO.



MARINE DIESEL ENGINE BLOCK



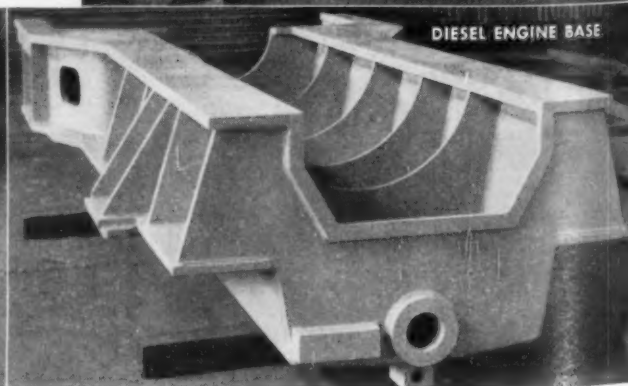
LADLES FOR MOLTEN METAL



LEAD POT



TIN POT

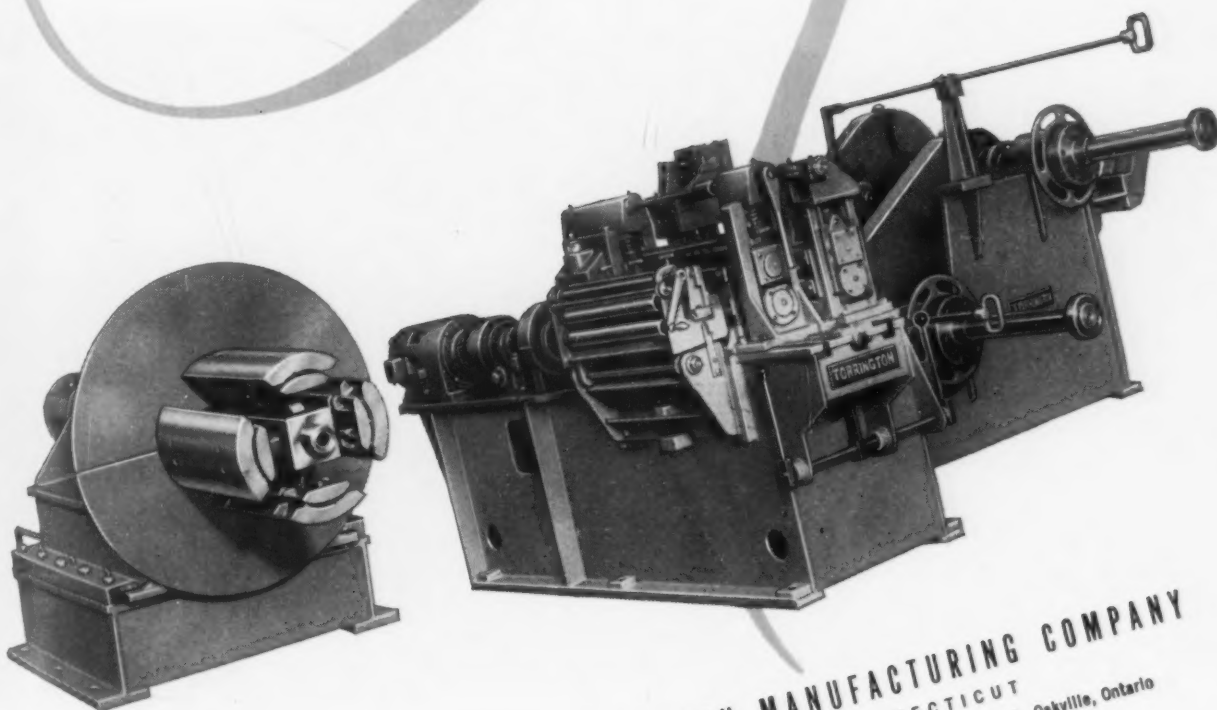


DIESEL ENGINE BASE

# ER

## **TORRINGTON'S NEW MEDIUM-DUTY SLITTING LINE**

- Fanning of strips eliminated with two flanged type winding arbors
- Versatility in core size possible with quick-change bolted arbor construction
  - Smoother cuts with pull-through operation
- Uniform tension, better cuts with adjustable power-operated expanding arbor payoff
  - Easy, rapid setup with hinged entry guide and sliding outer slitting housing
  - Anti-friction bearings throughout



**THE TORRINGTON MANUFACTURING COMPANY**  
 TORRINGTON, CONNECTICUT  
 Western Division: Van Nuys, California • In Canada: T. M. Co., Ltd., Oakville, Ontario

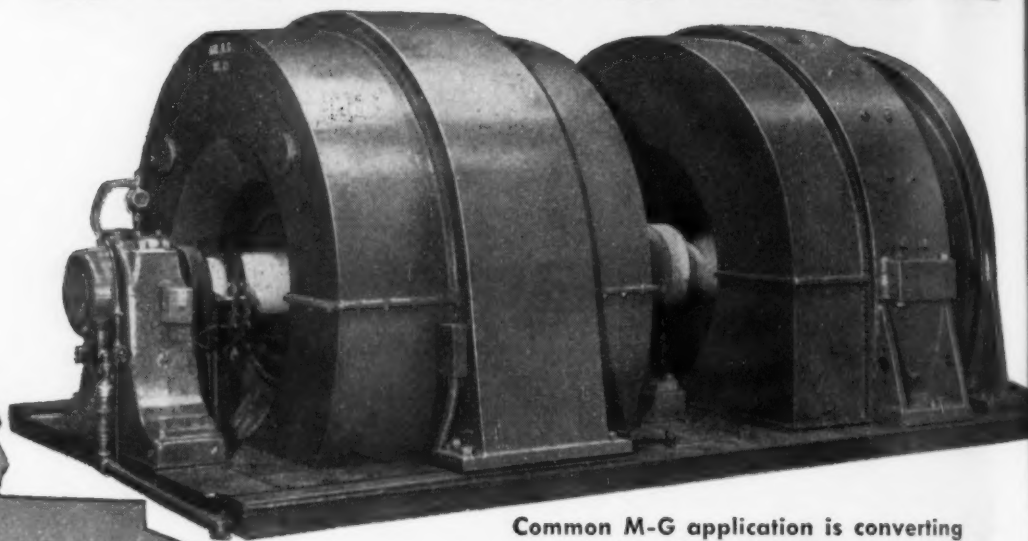


DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER SIXTY-FIVE YEARS

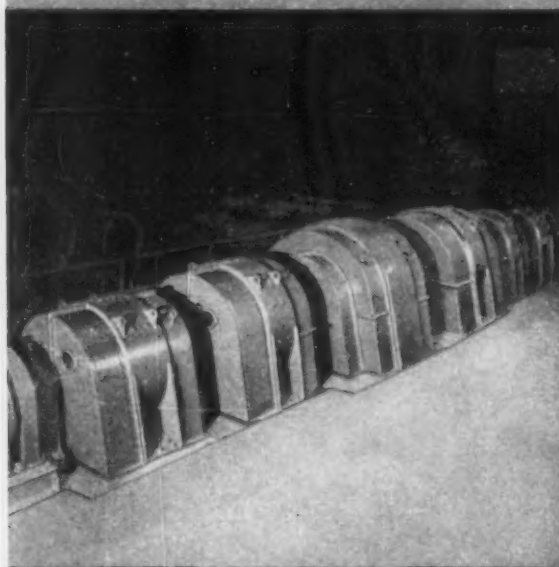
June 25, 1953



# From Coast



Common M-G application is converting ac to dc for mill supply. Above is a 1500 kw synchronous set in eastern mill.



## WEST

This 8-machine 2000 kw M-G set supports a two stand, four high tin temper mill with generators opposite their mill motors.

## MIDWEST

A 56-inch, four stand tandem cold reduction mill is supported by this 7-machine 7750 kw synchronous motor-generator set.



## EAST

Three 3-machine 6000 kw synchronous M-G sets supporting six finishing stand motors in a large East Coast steel rolling mill.

## TEMPER MILL

Three midwestern single stand temper mills are supported by these M-G sets. Synchronous motors of 1750 hp drive each set.



# t to Coast!

## ALLIS-CHALMERS M-G SETS ARE WIDELY USED IN SUPPORT OF STEEL MILL DC DRIVES

MAJOR STEEL PRODUCERS from Coast to Coast use Allis-Chalmers motor-generator sets. This nationwide acceptance in heavy duty service is proof of their durability and quality.

These representative M-G sets indicate the wide variety in design and size available. Allis-Chalmers has long experience with steel mill needs — having built M-G sets for all current applications — and will build special for any new requirement that may arise.

Motor-generator sets give you:

1. Power factor correction.
2. Regenerative braking.
3. Quick starting for emergency demand.

Only Allis-Chalmers gives you M-G sets with the exclusive *Frog-Leg* armature winding that *eliminates injurious commutator sparking*. *Frog-Leg* winding connects bars of equal potential through the winding itself . . . producing a perfectly equalized winding without the use of cross-connectors.

For full details on this heavy duty steel mill rotating equipment, ask for M-G Set Bulletin 05B6032A and Large DC Motor Bulletin 05B6002A. For your copies, just call the nearest A-C office or write direct to Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3920

*Frog-Leg* is an Allis-Chalmers trademark.

### PICKLING LINE

A pickling line in an eastern steel mill is supported by this 4-machine 1375 kw, 720 rpm synchronous M-G set.

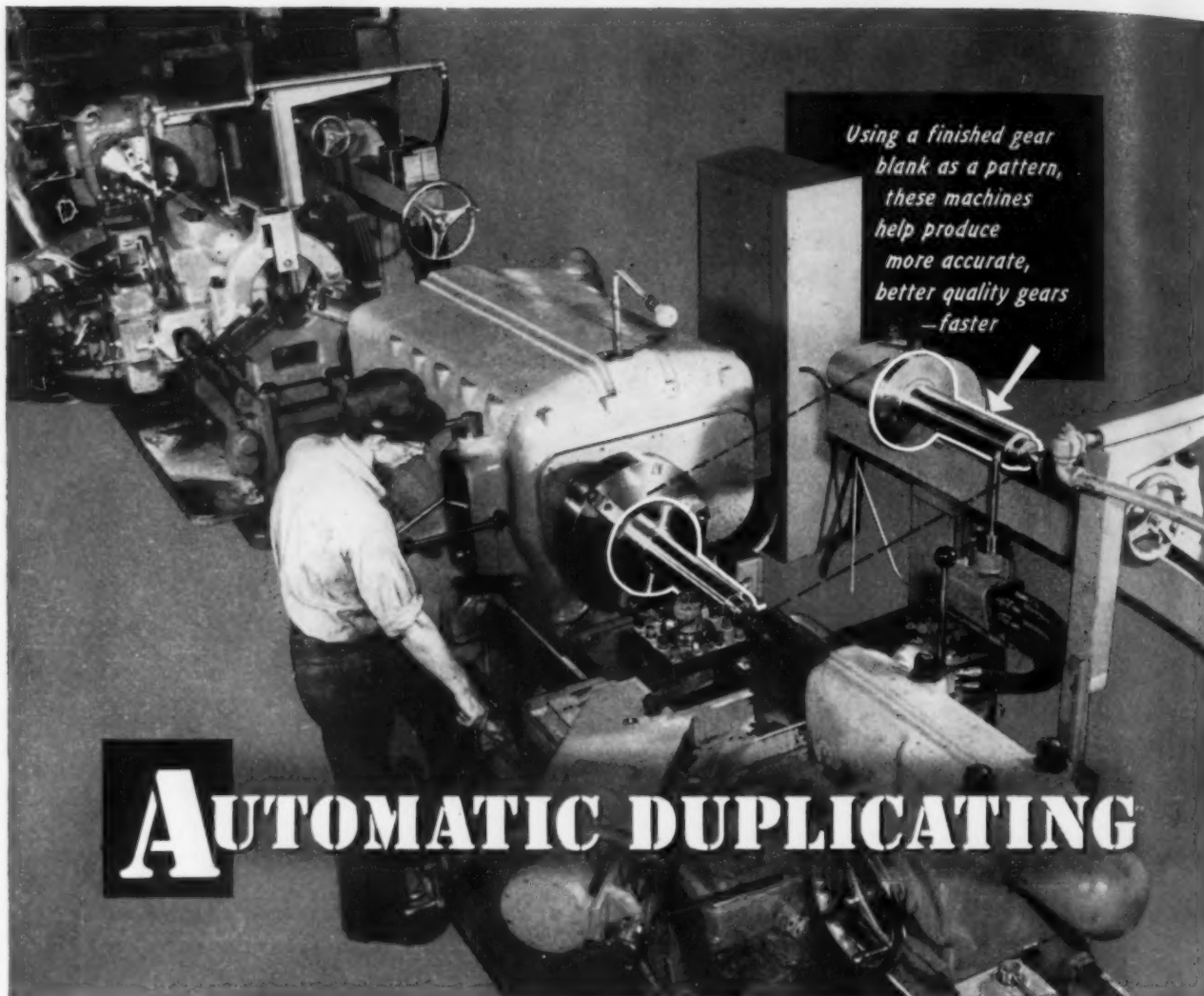
### RECORD BREAKER

A motor room, completely equipped by Allis-Chalmers, powered this 80-inch western hot strip mill to a new annual world tonnage record.

# ALLIS-CHALMERS

Power, Electrical, Processing Equipment for Iron and Steel





**A**UTOMATIC DUPLICATING of gear blanks in our shops, illustrated above, is faster and more accurate. And it indicates the advancements in modern gear manufacturing.

- Today quality gear manufacturing requires new machines and techniques plus experience and skill acquired making every conceivable type of gear, assembly, reducer, and transmission over a long period of time.
- It is this combination which BRAD FOOTE offers you to help solve the problems you may have. From our creation of the original drawing of the gears or assemblies you need, through every step of manufacture in our own shops, a series of controls guarantees quality. No one shares our responsibility.
- Whether your requirements call for only one standard or specially engineered gear, gearmotor, reducer, or transmission—or an unlimited quantity—you'll find BRAD FOOTE service to your liking. Your inquiries will receive prompt attention.



## **BRAD FOOTE GEAR WORKS, INC.**

1309 South Cicero Avenue • Cicero 50, Illinois  
Blshop 2-1070 • Olympic 2-7700

### **subsidiaries**

**AMERICAN GEAR & MFG. CO. • PITTSBURGH GEAR COMPANY,**  
Phone: Lemont 920  
Lemont, Illinois  
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Pittsburgh 22, Pennsylvania





**WHAM!**

**Boeing B-47**

***Stratojet***

**strikes at 600 m.p.h.**

**...tons of steel for tooling and jigs...  
supplied by **CASTLE****

**TEN TONS OF BOMBS**--deposited on target at better than 600 miles an hour--would produce such a devastating effect that it should definitely chill aggressive tendencies. That's the kind of a wallop the U. S. Air Force can deliver with the B-47 Stratojet, produced by Boeing Airplane Company, Wichita, Kansas. A. M. Castle & Co. is proud to be a factor in the production of this mighty bomber.

**FOR PEACE OR DEFENSE**--Castle is supplying steel--all types, kinds, sizes, and shapes--to thousands of producers from coast to coast. Some are large users, some are small--but each one is regarded as an important customer. And each one is given quick, friendly, cooperative service--on every order regardless of quantity. That's been Castle's policy for over 61 years.



**EVERYTHING IN STEEL**

COLD FINISHED BARS • STAINLESS  
STEELS • HOT ROLLED BARS • TOOL  
STEELS • ALLOY STEELS • SHEETS  
PLATES • STRUCTURAL and many others  
in a large variety of sizes, grades, and  
finishes--for immediate delivery.

*from coast to coast*

**IF YOU NEED STEEL**--whatever the type, kind, size, shape, or quantity--phone A. M. Castle & Co. right now! No obligation, of course. Nine large, heavily stocked, completely equipped warehouses strategically located from Baltimore to Seattle--assure you of fast, nation-wide service.

**A. M. CASTLE & Co.**

***STEEL DISTRIBUTORS***

BALTIMORE • CHICAGO • MILWAUKEE • ROCKFORD • KANSAS CITY • SEATTLE • SAN FRANCISCO • BERKELEY • LOS ANGELES

# ALUMINUM IS *Why* EVERY WHEEL ADDS FORTY POUNDS OF PAYLOAD

In most states, the maximum weight of a trailer tractor and its load is fixed by law. So, in the trucking business, the object is to put the weight in the freight and not in the rig that hauls it.

Truckers do this by using a lot of aluminum in their tractors and trailers. Alcoa Aluminum Forged Disc Wheels combine the strength and durability of a forging with the lightness of aluminum. Weighing 30 to 50 pounds less than their steel counterparts, they can add 400, 700, perhaps 1,100 extra pounds of payload—depending on the number of wheels the rig has.

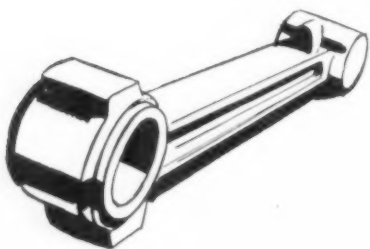
Alcoa Aluminum Forged Disc Wheels offer other important advantages besides weight savings. Tires run cooler because of aluminum's high-heat conductivity. Tires change easier because Alcoa Wheels are smooth and free from rust. Alcoa Wheels offer easier steering, longer tire life and smoother ride because they are precision forged and machined to run true.



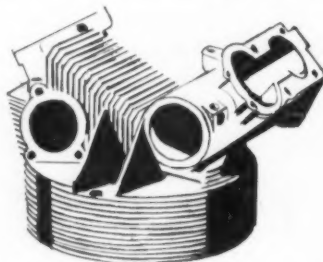
## Alcoa Aluminum

ALUMINUM COMPANY OF AMERICA

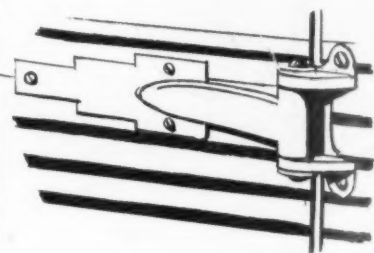
**ALCOA IS *How*** It was Alcoa who first recognized the extra bonus of lightness that forgings could give truck wheels. And it was Alcoa Engineers, who designed the first forged wheel. In Alcoa Research Laboratories, special testing machines were built to punish and study the wheels under every conceivable condition of service life. Almost 50,000 Alcoa Forged Disc Wheels are giving extra payload to truckers all over the country... many wheels have run over ½ million miles and are still going strong. Aluminum Company of America, 876-F Alcoa Building, Pittsburgh 19, Pa.



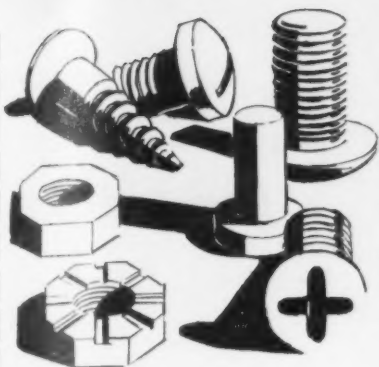
**CONNECTING RODS** for diesel engines, air compressors and outboard engines are forged of aluminum. They combine maximum strength with minimum weight and size.



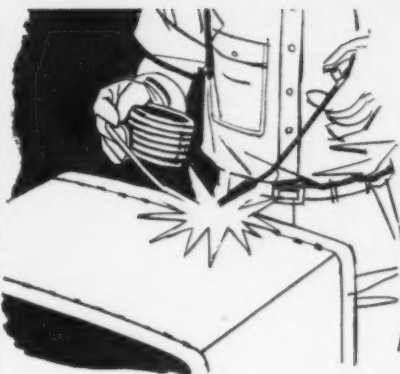
**CYLINDER HEADS** for aircraft have long been forged of aluminum by Alcoa. Aluminum heads increase power, reduce weight with no change in engine size.



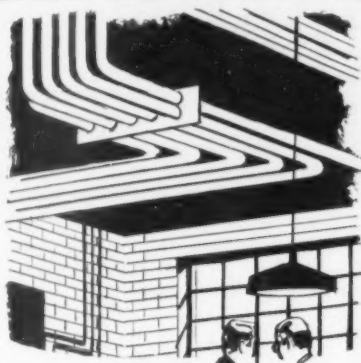
**FORGED HINGES** and other heavy-duty automotive hardware are forged of aluminum by Alcoa. Extra strong, extra light, corrosion resistant all the way through.



**\*FASTENERS** of Aluminum are made by Alcoa in every commercial size and shape. A must with aluminum assemblies, they also dress up wood and plastic products.



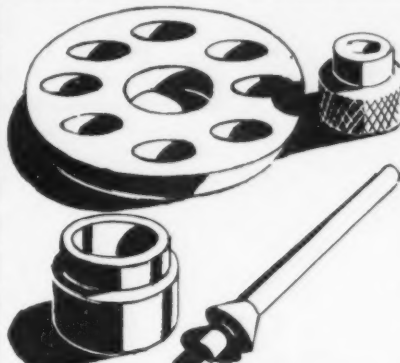
**\*FILLER METAL** of Alcoa Aluminum is available in many alloys for use in brazing, torch welding and arc welding. It is also packed suitably for automatic welding operations.



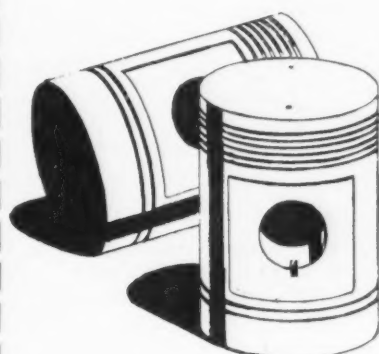
**\*RIGID CONDUIT** of Alcoa Aluminum is the lowest cost corrosion resistant metallic conduit available. Its nonmagnetic properties improve electrical efficiency—its light weight speeds installation.



**\*INDUSTRIAL BUILDING SHEET** of Alcoa Aluminum is light and easy to install. It never requires painting or maintenance—costs far less than you would think.



**SCREW MACHINE PRODUCTS** made of Alcoa Aluminum are light, lustrous and low cost. Alcoa's Edgewater, N. J. Plant is a screw machine job shop, turning out all types of fittings, special fasteners, etc., to customer specification.



**GIANT PISTONS** and bearings weighing up to 800 pounds are cast of aluminum in permanent molds at Alcoa foundries! Tolerances and surface finish are exceptional.

Products marked\*  
are available from  
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Products Co., Inc.  
Rochester  
Brace-Mueller-  
Huntley, Inc.  
Syracuse  
Brace-Mueller-  
Huntley, Inc.  
Whitehead Metal  
Products Co., Inc.

#### NORTH CAROLINA

Charlotte  
Edgcomb Steel Co.

#### OHIO

Cincinnati  
Williams & Co., Inc.  
Cleveland  
Williams & Co., Inc.  
Columbus  
Williams & Co., Inc.  
Toledo  
Williams & Co., Inc.

#### OKLAHOMA

Tulsa  
Metal Goods Corp.

#### OREGON

Portland  
Pacific Metal Co.

#### PENNSYLVANIA

Philadelphia  
Edgcomb Steel Co.  
Whitehead Metal  
Products Co., Inc.  
Pittsburgh  
Williams & Co., Inc.

#### TEXAS

Dallas  
Metal Goods Corp.  
Houston  
Metal Goods Corp.

#### UTAH

Salt Lake City  
Pacific Metals Co., Ltd.

#### WASHINGTON

Seattle  
Pacific Metal Co.

#### WISCONSIN

Milwaukee  
Central Steel and Wire Co.  
Steel Sales Corp.



For quick delivery



of steel

Call Ryerson



As the world's *largest* steel service organization, Ryerson maintains the *largest* stocks of all available steels.

Ryerson deliveries are fast... cover everything from structural shapes and plates of carbon steel and bright sheets of stainless to high-strength alloys.

Ryerson service includes expert engineering aid... personal help on your steel problems...

and sawing, shearing, flamecutting or otherwise preparing steel to your requirements.

With a network of 15 strategically located plants Ryerson brings quality steel quickly to your door. Although some stocks are currently unbalanced from a size standpoint, when you need steel—any kind or quantity—call the Ryerson plant nearest you and we will do our best to meet your every need.

#### PRINCIPAL PRODUCTS

**CARBON STEEL BARS**—Hot rolled and cold finished  
**STRUCTURALS**—Channels, angles, beams, etc.  
**PLATES**—Many types including Inland 4-Way Safety Plate.

**SHEETS**—Hot and cold rolled, many types and coatings  
**TUBING**—Seamless and welded, mechanical and boiler tubes  
**ALLOYS**—Hot rolled, cold finished, heat treated. Also tool steel

**STAINLESS**—Allegheny bars, plates, sheets, tubes, etc.  
**BABBITT**—Five types, also Ryertex plastic bearings  
**MACHINERY & TOOLS**—For metal fabrication

# RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT  
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



**4 HIGH, 5 STAND TANDEM  
HOT ALUMINUM MILL**

*Designed and Built by*

**UNITED**



**UNITED** can serve you no matter  
where in the world you are.

**ENGINEERING AND FOUNDRY COMPANY**  
PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • NEW CASTLE  
YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO  
LOBDELL UNITED COMPANY, WILMINGTON, DELAWARE  
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls,  
Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery.  
Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

# How Warner & Swasey Automatics cut costs for Thor Power Tool Company

Take a look at some of the typical time and cost savings  
delivered by Warner & Swasey 5-Spindle Automatic Bar Machines  
at Thor Power Tool Co., Aurora, Illinois...



**REDUCTION  
GEAR BLANKS**

Savings pay for several new machines!

Large variety required—in lot sizes of 150-1500 pieces. Material: 8460 Steel.

*Previous method:* 2 single-spindle automatics, running continuously.

**NOW**—one Warner & Swasey 5-Spindle Automatic does complete machining in equivalent of 4 days a week.



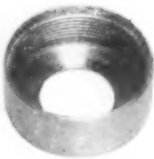
**DRIVE SHAFT  
IMPACT  
SPINDLES**

Accuracy and rigidity deliver 4 to 1 savings!

Material: Super tough rivet set alloy, especially made for Thor.

*Previous method:* Roughed on single-spindle automatic, straddled to length on turret lathe—both machines running at half speed.

**NOW**—finished for grinding in single operation on Warner & Swasey 5-Spindle Automatic running at full speed.



**THIN WALLED  
PROTECTION  
NUT**

Combines operations at high removal rate!

*Previous method:* Three operations—rough turned, relief cut made in second operation, Class 3 threads hobbled in third. Cost of last step alone ran 20¢ per part.

**NOW**—finished in one operation in 132 seconds on Warner & Swasey 5-Spindle Automatic.

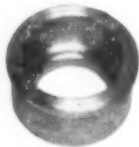


**REDUCER  
BUSHING**

Cuts Class 4 threads in same operation—costs reduced 8.5 to 1!

*Previous method:* Threads milled, following rough forming on single-spindle automatic.

**NOW**—Complete machining finished on Warner & Swasey 5-Spindle Automatic in one operation in 27 seconds!



**LOCK COLLAR**

Slashes machining time on longer runs!

Quantities: 20,000—30,000 pieces.

*Previous method:* Run on conventional multi-spindle automatics in 75 seconds.

**NOW**—on Warner & Swasey 5-Spindle Automatics parts made in 27 seconds!



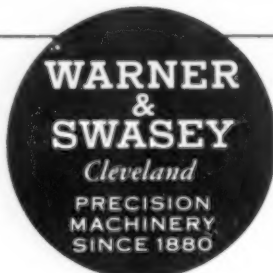
**SANDING PAD  
NUT**

One machine does work spread over 3 departments!

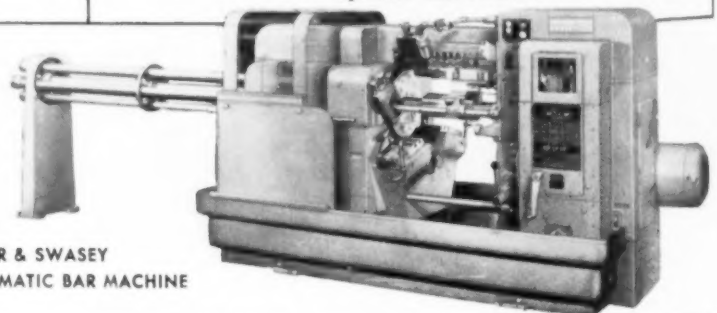
Problem: To thread part at perfect 90° angle to outside face, and hold concentricity.

*Previous method:* Part machined in 3 different departments. Difficulty was experienced in holding piece in fixture for knurling.

**NOW**—Thread tapped into bar stock and balance of cuts made, including knurling, in one operation on Warner & Swasey 5-Spindle Automatic.



**WARNER & SWASEY  
5-SPINDLE AUTOMATIC BAR MACHINE**



YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY



# FREE PUBLICATIONS

These publications describe money - saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

## Conveyor belts

Cambridge Wire Cloth Co. believes no single belt design can answer all the problems of combining movement and processing. As a result the company offers a wide variety of basic belt constructions and mesh sizes. Each type of belt has specific advantages—some are best suited for high temperature operations, others for carrying light loads through washing and drying sequences, still others for general handling. Photographs and complete details on different types of woven wire conveyor belts are presented in a new circular. *Cambridge Wire Cloth Co.*

For free copy circle No. 1 on postcard.

## Titanium descaling

Use of Virgo descaling salt for descaling titanium is thoroughly discussed in a new technical bulletin. Recommended descaling procedure for sheets, strip, wire, bars, forgings and fabricated parts are outlined. Effect of bath temperature in achieving successful results is stressed and temperature ranges for each product are given. *Hooker Electrochemical Co.*

For free copy circle No. 2 on postcard.

## Industrial floor sweeper

Who owns the most expensive feet in your plant? According to a folder put out by Parker Sweeper Co. it's the janitor using a push-broom. The company states that a man using a Parker Sweeper can cover five times as much area as he can with a regular broom. Both motor and manual sweepers are available. Complete details on these floor sweepers are given in a new bulletin. *Parker Sweeper Co.*

For free copy circle No. 3 on postcard.

## Investment casting

Forty specific applications of precision investment casting are illustrated and discussed in a new booklet issued by Gray Syracuse, Inc. Illustrations of castings in a variety of shapes and sizes in ferrous and nonferrous alloys are included. There is also information on tolerances and finishes. *Gray-Syracuse, Inc.*

For free copy circle No. 4 on postcard.

## Corrosion-proof linings

Nukem corrosion-proof linings are discussed in a new bulletin. Covered are: Koroseal, rubber, Nuran rubber, Neoprene and acid brick sheathings. A resistivity table showing the degree of resistance of different Nukem membranes to various types of solutions is contained in the publication. *Nukem Products Corp.*

For free copy circle No. 5 on postcard.

Turn Page

## Note on Use of Postcard

Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

FIRST CLASS  
PERMIT No. 36  
(Sec. 34.9 P.L.&R.)  
New York, N. Y.

## BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

## THE IRON AGE

Post Office Box 77  
Village Station  
NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 6/25/53

Circle numbers for Free Publications or information on New Equipment:

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31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
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If you want more details on other products advertised in this issue fill in below:

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YOUR NAME . . . . . TITLE . . . . .

COMPANY . . . . .

CO. ADDRESS . . . . .

CITY . . . . . ZONE . . . . . STATE . . . . .

NATURE OF BUSINESS . . . . .

## Free Publications

Continued

### Rust preventive

A free pint of clear, air-drying, rust-preventing Penetrol oil is being offered by the Flood Co. In addition, the company includes descriptive literature covering uses and advantages of Penetrol oil. *Flood Co.*

For free copy circle No. 6 on postcard.

### Dial gages

Boice Mfg. Co. has released a new 8-p. folder on its line of dial gages. One of the advantages of the company's dial bore gage is that it is possible to insert the instrument at an angle and still gage the hole accurately. Other gages discussed in the publication are dial indicator gages for checking ID and OD and the Set Master used to check these gages. *Boice Mfg. Co.*

For free copy circle No. 7 on postcard.

### More Literature Available

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers on p. 192.

### Speed car handling

Whiting Trackmobile can move from road to railroad track or from track to road in 30 sec, according to a new brochure. The dual truck which can be used on both roads and railroad tracks is said to be ideal for railway car switching, spotting or hauling. *Whiting Corp.*

For free copy circle No. 8 on postcard.

### Note on Use of Postcard

Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 6/25/53

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PAGE ..... PRODUCT .....

YOUR NAME ..... TITLE .....

COMPANY .....

CO. ADDRESS .....

CITY ..... ZONE ..... STATE .....

NATURE OF BUSINESS .....

FIRST CLASS  
PERMIT No. 36  
(Sec. 34.9 P.L.&R.)  
New York, N. Y.

### BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77  
Village Station  
NEW YORK 14, N. Y.

### Small parts handling

Vu-O-Matic Rotary Stands consist of a number of glass jars on a rotary stand which has several circular shelves. These units are used to solve the problem of small parts storage and are said to save time and storage space. It is claimed that these rotary stands can store more parts in less space than conventional storage drawers. Complete details are in a new bulletin. *Union Metal Mfg. Co.*

For free copy circle No. 9 on postcard.

### Cranes

Austin-Western's hydraulic crane is tractor-mounted and its pickup, carrying and placement capacities are said to combine the best features of crawler, truck and erection cranes with those of industrial shop cranes. The crane's telescopic boom can be raised 45 deg from horizontal and is continuously rotatable through a full 360 deg. More complete information is in a new folder. *Austin-Western Co.*

For free copy circle No. 10 on postcard.

### Sintered metal parts

U. S. Graphite Co. has published a new Gramix catalog covering its line of sintered metal parts. Gramix bearings, gears and other parts are produced in a wide variety of ferrous and nonferrous grades from metal powders compacted under heavy pressures in high temperature furnaces. The new catalog describes the way Gramix parts are made and lists their principal advantages. *U. S. Graphite Co.*

For free copy circle No. 11 on postcard.

### Chains, accessories

Carroll Chain Co.'s extensive line of chain and accessories are covered in a new catalog. Photographs, specifications and general information on chains is given in the company's 37-p. publication. *Carroll Chain Co.*

For free copy circle No. 12 on postcard.

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Big planers are usually slow planers. But not a GRAY! Bucyrus-Erie found that out when they put a new GRAY 132" x 120" x 50' Heavy Duty Planer to work. This precision GRAY with modern high speeds and operating conveniences is machining a 55' long side section of revolving frame of a Bucyrus-Erie dragline . . . a big mouthful in any shop. Again, performance is proving that planer jobs don't grow old on a GRAY.

Write today • get the story on **HIGH** low cost **PRODUCTION**

DEPT. C

*The G.A.* **GRAY** *Company*

CINCINNATI 7, OHIO, U. S. A.

SOLD IN CANADA BY UPTON, BRADEN AND JAMES, LTD. • SOLD IN NORTH AMERICA BY MACHINE AFFILIATES

to build  
**GIANTS**  
that move  
**MOUNTAINS**

planers • milling planers  
planer type milling machines  
horizontal boring machines



# Specify WHEELABRATOR<sup>®</sup> STEEL SHOT

**19 Control Checks for QUALITY  
Assure PEAK PERFORMANCE**

Continuous laboratory control and 19 inspection checks in our modern new plant take all guesswork out of the manufacture of "Wheelabrator" Steel Shot. It is this exacting production control which assures the right combination of toughness, solidity, uniformity and efficiency required for improved blast cleaning performance and lower cleaning costs. Try it soon.

## 1 STRUCTURE:

The microstructure of shot is of primary importance to cleaning speed and shot life as well as machine maintenance life. In producing Wheelabrator Steel Shot chemical analysis and microstructure, scientifically formulated after years of research, are rigidly maintained by 6 control checks to assure a product which is round, solid and free from surface cracks.

## 2 HARDNESS:

The hardness of Wheelabrator Steel Shot selected for the most effective and economical cleaning and peening of all types of work was determined by our experience in installing and servicing more than 6000 Wheelabrator blast machines. This hardness is uniform and is achieved by exacting control of the analysis and by double heat treatment at automatically controlled temperatures.

## 3 RESISTANCE TO BREAKDOWN:

The toughness and native impact strength of Wheelabrator Steel Shot drastically reduces shot consumption. Made of the toughest high carbon steel, it is subjected to daily tests to determine its resistance to breakdown under impact. Because it lasts so much longer, it lowers cleaning costs per ton and reduces shipping, storage and handling costs.

## 4 CONSTANT UNIFORMITY:

All 19 control checks listed at the right guarantee the uniformity of Wheelabrator Steel Shot. These elaborate control checks, combined with our modern automatic equipment, assure the constant high quality of this shot. As a result, you are sure of receiving the same highly efficient performance of the "test run" from every shipment.

### WRITE FOR BULLETIN 89 TODAY

Get the complete story about "Wheelabrator" Steel Shot and what it means to you in terms of performance and economy.



This new plant was designed for one purpose only—to produce the world's best blast cleaning shot.



**American**  
WHEELABRATOR & EQUIPMENT CORP.  
510 S. Byrkit St. Mishawaka, Ind.

### MELTING

1. Rigid scrap selection.
2. Preliminary carbon and manganese analysis.
3. Complete chemical analysis.

### POURING

4. Accurate and continuous control of pouring temperature.
5. Accurate and continuous control of quench temperature.

### FIRST SCREENING

6. Visual and metallographic inspection in as-cast condition.
7. Hardness check in as-cast condition.
8. Continuous inspection of screening operation.

### DRYING and SHOT CONDITIONING

9. Recording temperature control.
10. Removal of objectionable material.

### SECOND SCREENING

11. Continuous inspection of screening operation.

### FIRST HEAT TREATING

12. Automatic control and permanent record by recording instrument of heat treat time and temperature.

### SECOND HEAT TREATING

13. Automatic control and permanent record by recording instrument of heat treat time and temperature.
14. Continuous tests for hardness and carbon content.
15. Continuous microscopic inspection.

### FINAL SCREENING

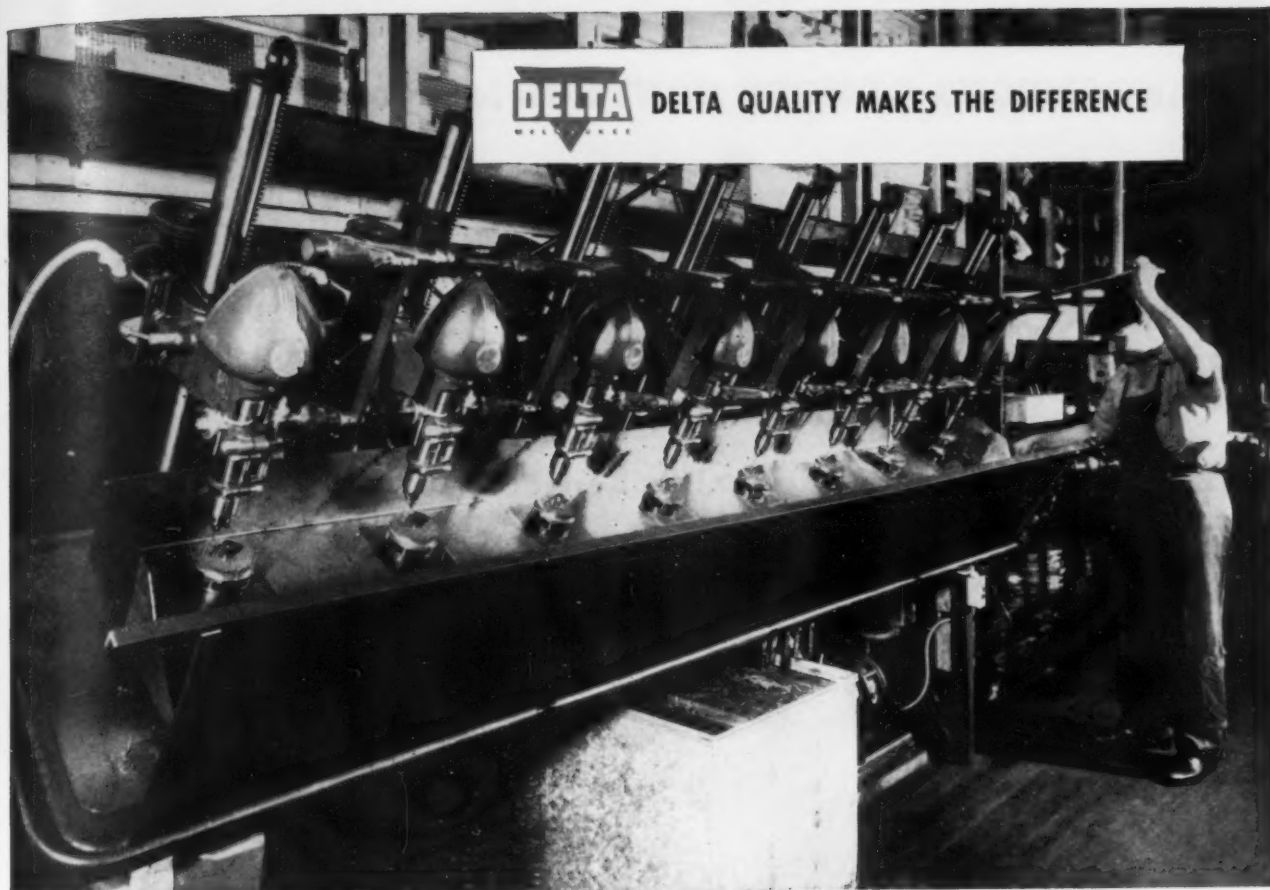
16. Continuous inspection of screening and shot.
17. Daily laboratory checks of screening accuracy.

### BAGGING

18. Continuous inspection of shot.
19. Daily shot breakdown tests.



THE ONLY BLAST EQUIPMENT MANUFACTURER PRODUCING SHOT IN ITS OWN PLANT



## New "slant" on **DELTA** Drill Presses boosts output at Atlantic Service Co.

**Easier cleaning, better lubricant flow, reduced operator fatigue are extra benefits for Brooklyn shop.**

A gang set-up of eight Delta 14" Drill Presses mounted at an angle of about 30° and operated by one man, boosted output and made a healthy cut in costs for Atlantic Service Co., Brooklyn, N.Y. This production speeding hook-up was possible because versatile Delta Drill Presses operate in any position: upside down, sideways, at any angle.

All spindles in Atlantic's set-up are connected to a master shaft and move simultaneously. Parts to be drilled are held on adjustable jigs. As many as 100 holes are drilled in each piece.

The tilted table is easy to keep clean, improves lubricant flow, makes the operator's job

much easier—all of which contribute to a competitively low production cost.

Why not work out your own money-saving slant... as thousands of resourceful shop men are doing? Your Delta dealer can help you—he's listed in your Classified Telephone Directory under "Machinery" or "Tools". Write for the latest Delta catalog. Delta Power Tool Division, Rockwell Manufacturing Co., 640 F.N. Lexington Avenue, Pittsburgh 8, Pa.

**DELTA** QUALITY POWER TOOLS  
Another Product by **Rockwell**



Only P&H DIAL-LECTRIC

INSTANTANEOUS REMOTE CONTROL lets you

# change heat lightning-fast

... gives you Inert-Gas Welding at its best,  
AC and DC

You get this  
exclusive P&H feature

## in P&H High-Frequency Arc Welders

A simple turn of a dial or a touch of the toe gives you the heat you call for *right now* — not seconds from now! That's because P&H Dial-lectric Control is electrical, not mechanical. Response is instant — there's no time lag. It's a P&H "exclusive" that boosts production, cuts costs, saves time. And it's just one of the advantages you get with P&H High-Frequency AC and DC Arc Welders, available in sizes up to 625 amps. Ask your P&H representative or distributor for all the facts. Or write us for latest bulletins.

**P&H** WELDING DIVISION  
**HARNISCHFEGER**  
CORPORATION

4401 W. National Ave. • Milwaukee 46, Wisconsin



P&H AC Arc Welder



P&H DC Arc Welder

the **P&H** Line



TRUCK CRANES



DIESEL ENGINES



POWER SHOVELS



PREFABRICATED HOMES



ELECTRIC HOISTS



SOIL STABILIZERS



WELDING EQUIPMENT



OVERHEAD CRANES



# PERFECT SURFACE IS A "MUST". . .

Large drying rolls, like the one below receiving its final polishing pass, are used in "Yankee Dryer" paper-making machines which turn out soft facial tissue. Even slight surface flaws in these eight- and twelve-foot diameter castings cause them to be rejected.

## *So they use* **CHATEAUGAY PIG IRON**

. . . the low-phosphorus, copper-free pig iron that has eliminated scrap losses in countless "tough casting" jobs. With CHATEAUGAY, consistently uniform "physicals" assure predetermined fine grain structure throughout every casting, regardless of size or shape.

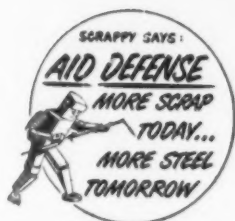
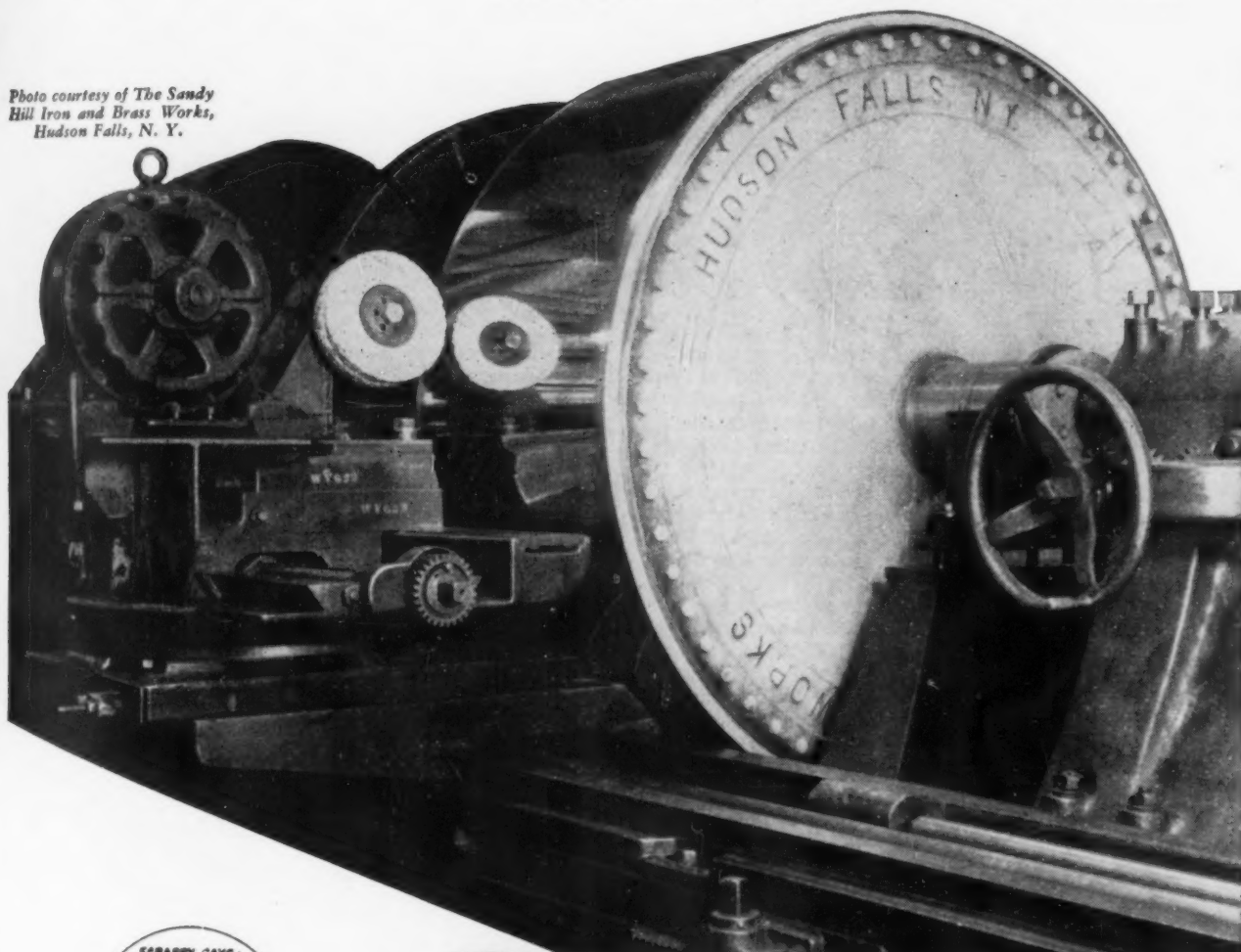
Whatever the requirements of your castings—if ordinary pig iron won't do the job—NOW is the time to investigate the *exclusive* advantages of premium CHATEAUGAY. A Republic Pig Iron Metallurgist will be glad to give you the complete facts at your convenience. Write today to:

### **REPUBLIC STEEL CORPORATION**

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, New York

Photo courtesy of The Sandy Hill Iron and Brass Works, Hudson Falls, N. Y.



## *Republic* **PIG IRON**

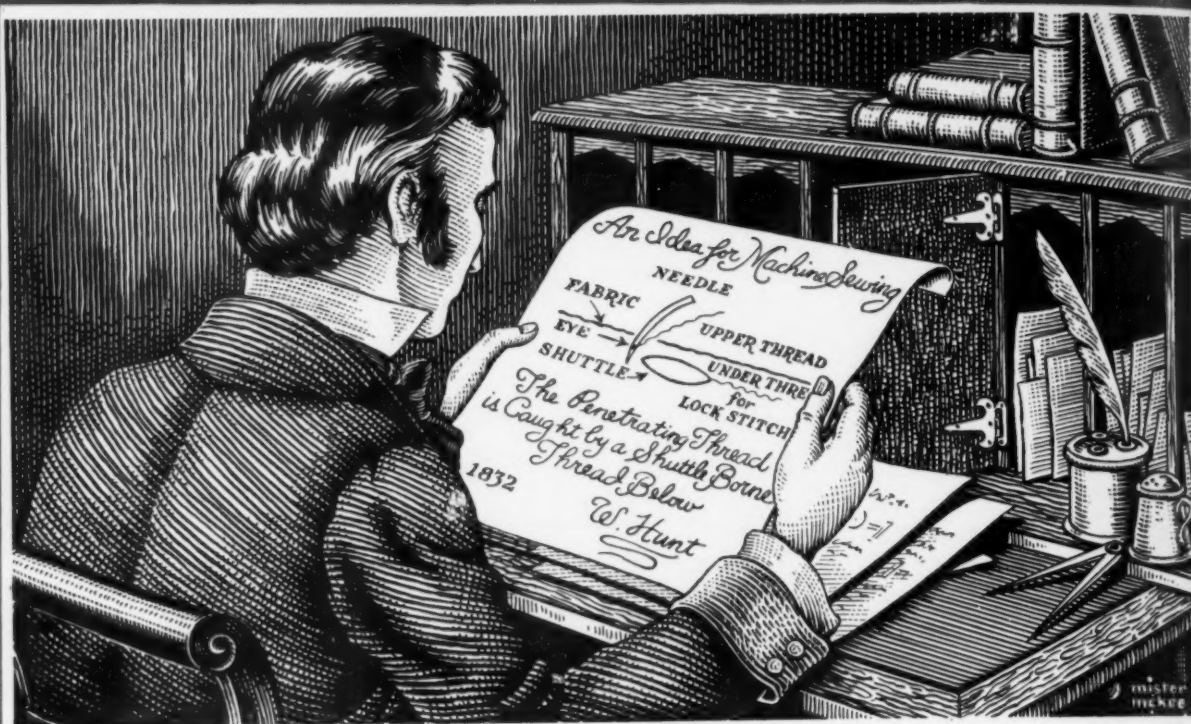
"CHATEAUGAY"  
Low-Phosphorus,  
Copper-Free

"REPUBLIC"  
(Northern)  
Foundry, Basic  
and Malleable

"PIONEER"  
(Southern)  
Foundry and Basic



## TOUGH PROBLEMS AND THEIR GREAT SOLUTIONS



# Two Million Dollars for a Needle

Sewing is probably as old as mankind, but not until the year 1832 did the hole move to the point of the needle, so that machine sewing became possible. Walter Hunt of New York City had this great idea, combining with it the shuttle-carried lock-stitching thread on the underside of the fabric.

Elias Howe usually gets credit for inventing the sewing machine, but actually he worked out the idea twelve years after Hunt. Howe, you see, had the good sense to patent the idea. It brought him over two million dollars.

It's great to have an idea. It's much more wonderful to make it work. That's where we come in.

Often difficult and unusual problems are involved in operating mechanisms that depend on *pliable parts*. These must be *composed* and *designed* for continuous dependable service under a wide variety of environment and operating conditions, often in the presence of deteriorative materials or conditions.

For such critical parts, perhaps the most versatile and reliable material ever developed is SIRVENE. This is an oil-resistant elastomer (loosely called synthetic rubber) *compounded in formula* as will best meet the specific need.

SIRVENE engineers are constantly working on pliable part problems, in scores of fields. They are constantly developing new SIRVENE compounds.

And when design and compositions are determined, C/R quantity production takes over, operating at laboratory-quality level.

Let SIRVENE engineers work with you from the inception of your idea for a new product. They can short-cut your work, protect you in advance against disappointment.

"Engineering with Sirvene" will be sent with our compliments if you request it. It belongs in your files.

*Sirvene products include diaphragms, boots, gaskets, oil seals, washers, packings and similar molded parts.*

### CHICAGO RAWHIDE MANUFACTURING CO.

1229 Elston Avenue SIRVENE DIVISION Chicago 22, Illinois



# SIRVENE

SCIENTIFICALLY COMPOUNDED ELASTOMERS

### SIRVIS MECHANICAL LEATHER PRODUCTS

Boots, diaphragms, packings and other products that give dependable service under difficult operating conditions.



### PERFECT Oil Seals

More automobiles, farm and industrial machines rely on C/R Oil Seals than on any similar sealing device.



### Representatives in these Principal Cities

Boston • New York • Syracuse • Buffalo • Philadelphia  
Pittsburgh • Cincinnati • Cleveland • Detroit • Peoria  
Minneapolis • Wichita • Houston • Los Angeles  
San Francisco



# Unequaled-anywhere!

IT ALL COMES DOWN to one fact...that Roebling high carbon flat spring steel is absolutely unequalled for cutting down preparation time, machine stoppages and rejects. What's more, it's made as you want it...annealed, hard rolled untempered; scaleless tempered; tempered and polished, blued or strawed.

You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



**ROEBLING**



A subsidiary of The Colorado Fuel and Iron Corporation



California giant Sequoias—  
largest of all trees.

**BRANCHES:** ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

PHOTO BY MCRAULS



# Molybdenum . . . for all uses



Handling tons of molten iron or steel is no job for a novice. Thousands of man-hours and dollars hinge on the certain knowledge of experience, making the right decisions at the right time, adding the correct quantities of the right alloying elements exactly when they'll do their best work.

The experienced melter knows he can depend on MCA Molybdenum additions for uniform effects as calculated. And whether the main objective be to improve deep hardenability, eliminate temper brittleness, improve machine-

ability, or upgrade some other physical or metallurgical property, MCA "Moly" has long established its reputation too.

MCA Molybdenum has become the standard of comparison and the leader in its field, through constant technical research and application in the metallurgical industry.

As recognized authorities in the application of Molybdenum, Tungsten, Boron, Rare Earths, and the alloys and chemical elements of these materials, MCA assures confidential and immediate response to inquiries.

## MOLYBDENUM

### CORPORATION OF AMERICA

Grant Building

Pittsburgh 19, Pa.

Offices: Pittsburgh, Chicago, Cleveland, Detroit, Los Angeles, New York, San Francisco  
Sales Representatives: Edgar L. Fink, Detroit; Brumley-Donaldson Co.; Los Angeles, San Francisco  
Subsidiary: Cleveland-Tungsten, Inc., Cleveland, Ohio  
Plants: Washington, Pa. and York, Pa.





## Keep in step with this man

... he's one of the most influential men in America. He's a salesman.

Some think of him as "just a salesman", it's true. But to the astute, he's more than that—much more.

He is a veritable mine of information, ready and waiting to be tapped.

He makes it a rule to keep himself well-informed on many things that have vital bearing on *your* business:—new methods in material handling or recent developments in machine tools, for instance.

He may very well have red-hot news on abrasive wheels, steels or alloys for cutting tools—data that might have been released by the manufacturer only yesterday.

He can probably tell you whether or not your lathes, milling machines, drills, planers, shapers, boring mills, broaching machines, gear cutters and grinding machines are running with the optimum combination of feeds and speeds.

He has a good idea of how your machine tool equipment stacks up against the best, and can judge pretty well if your costs are as low as they could be.

In short, he's loaded with information and sparking with ideas that might help you produce better.

He deserves—and will appreciate—your friendly attention. Perhaps he's coming in your door right now...



Send for your free copies of "Work Done on the Blanchard", fourth edition, and "Art of Blanchard Surface Grinding".

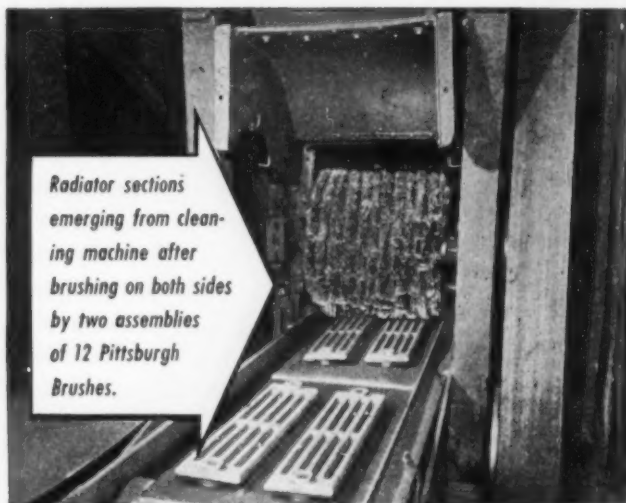
BLANCHARD SURFACE GRINDERS • BLANCHARD GRINDING WHEELS

PUT IT ON THE

THE BLANCHARD MACHINE COMPANY  
64 STATE ST., CAMBRIDGE 39, MASS., U. S. A.

BLANCHARD

Distributors in principal cities



Radiator sections emerging from cleaning machine after brushing on both sides by two assemblies of 12 Pittsburgh Brushes.

## Pittsburgh Brushes can help you solve problems like these!

**Cleaning Narrow Spaces**—National Radiator Company, Johnstown, Pa., cleans 30,000 radiator sections a week! To insure a perfect final finish, even the narrowest spaces must be absolutely clean prior to assembly. Pittsburgh engineers were asked to design a brush that would reach these spaces and would fit National's existing machine. Successful? National reports: "Pittsburgh Brushes do a better job of cleaning and are more economical!"

**Preparing Chills**—At Continental Foundry & Machine Co., East Chicago, Indiana, chills used to cast iron rolls must be cleaned of the oxidized metal remaining from previous usage, as well as dirt and grease accumulated in storage. After experimenting with other brushes, Continental chose Pittsburgh because they "do the job better and stand up longer than any previously used!"

**Improving Original Equipment**—The Sommer and Maca Glass Machinery Co., Chicago, Illinois, uses Pittsburgh Brushes in the automatic washing machines they manufacture. Brushes formerly used simply didn't have the over-all density pattern needed. Pittsburgh engineers studied the problem and designed a brush which Sommer and Maca approved "because of (its) denser bristle pattern and lower cost."

### WRITE TODAY FOR FREE BOOKLET!

Write today for a free copy of our booklet that shows, through actual case histories, how Pittsburgh cuts brushing costs. Address: PITTSBURGH PLATE GLASS COMPANY, Brush Div., Dept. W-10, 3221 Frederick Ave., Baltimore 29, Maryland.



### PITTSBURGH

*Power Driven*  
**BRUSHES**



BRUSHES • PAINTS • GLASS • CHEMICALS • PLASTICS

**PITTSBURGH PLATE GLASS COMPANY**

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

## USE JOMAC<sup>®</sup> ARMORKOTE WORK GLOVES

ARMORKOTE Gloves—Jomac Cloth with plastic-coated palm and fingers. Widely used in handling steel and sheet metal, rough and finished castings, heavy machinery and machine parts; concrete block, bricks, lumber and structurals, and for general handling.

ABRASION RESISTANT • POSITIVE GRIP • OUTWEAR LEATHER



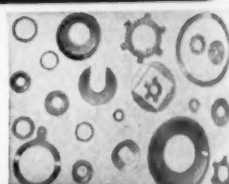
Write for new Jomac catalog and samples

**C. WALKER JONES CO., PHILADELPHIA 38, PA.**



**"WHITEHEAD  
WILL HAVE DIES FOR THESE  
WASHERS"**

Washers are "big business" with Whitehead. Production is fast, economical. Big runs from automatic presses. U. S. Air Corps Standard washers, U. S. and S.A.E. Standards, etc. **WRITE FOR CATALOG.**



**WHITEHEAD STAMPING CO.**

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## WEBB WIRE



NEEDLE  
and  
STAINLESS



**THE CARPENTER STEEL CO.**

Webb Wire Div.  
NEW BRUNSWICK, N. J.



# THE CLEARING HOUSE

## CONSIDER GOOD USED EQUIPMENT FIRST

### AIR COMPRESSOR

18" x 11" x 14" Sullivan WJ-3 Air Compressor 885 CFM. Driven by 150 H.P. Westinghouse Syn. Motor 440/3/60

### BALER

Loemann Model 7-PH Baler, Complete with Pump & Motor, Chamber 60" long x 16 1/2" wide x 18" deep. Finished bundles 16 1/2" x 6", aver. 60 to 90#

### BAR TURNING MACHINE

Medart HF-2 Bar-Turning Machine, Capacity 1" to 2 1/2", Complete with Accessories

### BENDING ROLLS

12 1/2" Niles Cement Pond Pyramid Type Bends. Roll 18"x14" Hilles & Jones Pyramid Type Bending Roll 20"x1" Southark Pyramid Type, Bending Roll

### BRACKS—LEAF TYPE

8 1/4" Dreis & Krump Size 186  
8 1/4" Dreis & Krump Size 188

### BRACKS—PRESS TYPE

8 1/4" Dreis & Krump Press Brako, V-Belt Drive 14 1/4" All Steel Hydraulic Press Brako, Complete with Pump and 20 H.P. A.C. Motor

### BULLDOZERS

No. 26 Williams & White Bulldozer, V-Belt Drive 20" Stroke, Ram 60" x 24" x 12"  
No. 29U Williams & White Bulldozer, Motor Drive 28" Stroke, 36" x 20" x 108" Face of Crosshead

### CHARGING MACHINE

600 lb. Brosius Floor Type Gasoline Driven Charging Machine, Equipped with Peel, Buda Gasoline Engine, Rubber Tires

### CRANES—GANTRY

3 ton Whiting Two Leg Gantry Crane 87" Span Motors 220/440/3/60. Equipped with Bucket NEW 1943

15 ton Shaw Box Two Leg Gantry Crane 65" Span with 19" Overhang, Three Motors 440/3/60

### CRANES—LADLE

75 ton Morgan Ladle Crane 49" 6" Span 4-Girder Construction, with 25 Ton Auxiliary, Complete with Motor for 250 Volt D.C.

125 ton Alliance 4-Girder Double Trolley Ladle Crane 85" Span, Complete with Electrical Equipment

### CRANE—MATERIAL HANDLING

Mead-Morrison Crane with 1 Yd. Bucket, Capacity 40 tons per hr. Span of Crane 113' 9"

### CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton Robbins Myers 28'6" Span 220/3/60  
5 ton Bedford 52" Span 220/3/60 A.C.  
10 ton Northern 77" Span 230 Volt D.C.  
10 ton P & H 77" Span 230 Volt D.C.

Equipped with 2 hooks spaced 11' apart  
15 ton Niles 60" Span 230 Volt D.C.  
15 ton Shaw 70" Span 550/3/60 A.C.  
20 ton Toledo 87" Span 115 Volt D.C.

With 220/440/3/60 Motor Generator 377" Span 220/3/60  
With 5 ton Aux. Hoist 47'10" Span 230 Volt D.C.  
25 ton Morgan 48'7" Span 230 Volt D.C.

With 5 ton Auxiliary 75" Span 220/3/60 A.C.  
30 ton Northern 75" Span 220/3/60 A.C.  
With 5 ton Auxiliary 64'6" Span 220 Volt D.C.

With 5 Trolleys 63 1/2" Ton & 10 Ton Aux.

### DIEMING MACHINES

100 ton Henry & Wright Dieing Machine, 4" Stroke, 13" Shut Height, Complete Elec. Equip.  
25 ton Henry & Wright Dieing Machine, 1 1/4" Stroke  
50 ton Henry & Wright Dieing Machine, 4" Stroke  
75 ton Henry & Wright Dieing Machine, 3" Stroke  
150 ton Henry & Wright Dieing Machine, 5" Stroke

### DIE SINKING MACHINE

Model BL-2416 Keller Die Sinking Machine  
3 Spindle Gear Head, Full Automatic Type

### DRAW BENCH

50,000# Standard Double Draw Bench, Complete with 100 H.P. G.E. A.C. Motor & Starter, Will draw rod 50 ft. long

### EDGE ROLLING MACHINE

Kane & Roach Edge Rolling Machine, Motor Drive, Capable of rolling a half round edge on mild steel up to 1/16" thick and from 1/2" to 6" wide

### FLANGING MACHINE

1/2" McCabe Pneumatic Flanging Machine, Pneumatic Holdowns

### FORGING MACHINES

5" Ajax Forging Machine—Heavy Duty Steel Frame Suspended Header and Gripper Slides 30 HP, G 220/3/60 Motor & Starter Factory Rebuilt with Standard Air Clutch.

### FORGING MACHINES

1 1/2" 2" 3" 4" 5" 7", Ajax  
1" 2" 3" 5" Acme  
5 Ajax—Air Clutch

### FURNACES—ANNEALING

Surface Combustion Co. Disc Type Annealing Furnace, Capacity 52 wide sheet x 3/4" thick is 5000 lbs. per hour

Furnace Engr. Co. Bell Type Annealing Furnace Gas Fired Oping. Space 40"x10" Round, 500 CFM Cap. Model 501 Salem Engr. Co. Annealing Furnace Gas or Oil Fired, Rated 3,475,000 BTU per hr. Capacity 2000# per hr. at 1400° brass or bronze Capacity 1500# per hr. at 1400° steel

Size of openings each end 20" high x 24" wide Lindberg Roller Hearth Production Sintering Furnace Rated at 152 KW, Max. Operating Temperature 2100° F. Working Chambers 18" Wide x 12" High

### FURNACES—HEATING

30 ton per hr. Morgan Continuous Pusher Type Billet Heating Furnace, Hearth 20" x 40", Complete with Electrical Equipment

NEW Oil Fired Surface Combustion Furnace, Inside width 3', Length 13', Opening 8", 4840 lb per hour net work to 2200° F.

60 KW Leeds & Northrup Home Furnace #9478-UB-25, with controls, Work space 25" dia. x 28" deep

### FURNACES—MELTING

200-300# Size "V" Moors "Lectromelt Furnace Tilt Type, Complete with 100 KVA G.E. Transformer for 240 volt primary

1000 lb. Model "U" Stroman Tilting Type Melting Furnace, Oil Fired V-12 Top Charge Hydraulically Operated, Complete with Transformer Equip.

20 ton Moore Size "NT" Melting Furnace—NEW

### GEAR REDUCERS

500 H.P. United Combination Reduction Gear & Pinion Stand, Gear Ratio 8.581:1  
000 H.P. Farrel Birmingham, Size 13 Reduction Gear, Ratio 720 to 244 RPM

700 H.P. Falk Single Reduction Gear, Ratio 375 to 200 RPM  
1800 H.P. Mesta Gear Reduction Unit, Ratio 19:1

### GRINDER—ROLL

26" x 96" Landis Roll Grinder, Complete with Pump and Motors

### HAMMERS—BOARD DROP

800 lb. Chambersburg Model J-2  
1200, 1600 lb. Chambersburg  
1000, 3000 lb. Billings & Spencer

### HAMMERS—STEAM DROP

2040, 2500 lb. Chambersburg  
1500 lb. Erie

### HAMMERS—STEAM FORGING

1200 lb. Massillon Single Frame  
1500, 1600, 2000, 3000, 4000, 6000 lb. Chambersburg  
600, 1500, 2500 lb. N.P.B.  
600, 1500, 2000, 2500, 3500 Erie

10 ton Massey Steam Forging Hammer

### HAMMERS—MISCELLANEOUS

No. 6N Nazel Hammer, Gearing Motor Drive  
2000 lb. Chambersburg Pneumatic Hammer, Complete with Elec. Equip. New 1951

### LEVELERS—ROLLER

17' McKay Roller Leveler, Inverted Type  
17 Rolls 1 1/4" Dia. Capacity 18 to 30 Ga.  
73" Sutton Roller Leveler 17 Rolls 2 1/4" Backed-up

### MILLING MACHINE—PLANNER TYPE

36"x36"x12" Ingersoll Adjustable Rail Planer Type  
Milling Machine, 2 Side Heads, 1 Rail Head

### MOTORS

100 H.P. Westinghouse Induction Motor, 6900 Volt 3 phase 60 cycle 600 RPM  
1250 H.P. Westinghouse Induction Motor 6900 volt 3 phase 60 cycle 593 R.P.M.

2000 H.P. General Elec. Induction Motor 6900 volt 3 phase 60 cycle 600 R.P.M.  
2500 H.P. General Elec. Direct Current Motor 6900 volt 175/350 R.P.M.

### PLATE DUPLICATOR

Thomas Machine Co. Plate Duplicator 150 Ton Table area for 6' x 20' plates

### PRESES—COINING & EMBOSING

EG-50 Ferracute 400 ton Press, 1 1/4" Stroke 10" x 15" Roller  
E-53 Ferracute 250 ton Press, 3/4" Stroke 8" x 16" Roller

### PRESES—HYDRAULIC

75 ton Williams & White Hydr. Straightening Press Stroke 16", Gan 27", Complete with Pump & Motor  
200 ton Bliss Hydrodynamic 48" Stroke Bed Area 24" x 24", Hyd. Pump Incl.

500 ton Southark Hydraulic 24" Stroke, 78" Day-light Platen 64" R to L x 32" F to B  
500 ton Southark Open Throat Hydraulic Press 12" Stroke Plate 58" x 56"

700 ton Edmets Forging Press 27" Stroke, 30" Dia. Ram, Platen 48" x 88" with overhang 40" x 129". Complete with Pump and Motor

### PRESS—INCLINABLE

125 ton Waterbury Farrel Inclined Press, 4" Stroke, Bed Area 36" x 42"

### PRESES—STRAIGHT SIDE

No. 3 Ferracute Super Speed Punch Press 30 ton Capacity, NEW 1946—never used  
No. 3 National Forging Maxipress 700 ton 6" Stroke, Ram 32" x 22", Motor Driven

SI-40 Verson 200 ton Press, 30" Stroke, Bed Area 40" x 44"

### PRESES—TRIMMING

No. 204 Bliss 50 ton capacity, with Side Shear Stroke 4", Bed Area 22" x 19"  
No. 204 1/2 Bliss 70 ton capacity, with Side Shear Stroke 4", Bed Area 24" x 23"

### PUNCH & SHEAR COMBINATIONS

No. 1/2 Buffalo Universal Ironworker, Motor Dr. Capacity 1 1/2" Round, 1 1/2" Square, 3 x 3 x 3/4" Angles, Punch 1" thru 3/4"

No. 4 1/2 UD Buffalo Universal Ironworker, Motor Driven, With Built-in Notcher, NEW 1946, Capacities: Punch 1 1/2", thru 1 1/4", Shear, Rounds 3", Squares 2 1/4", Angles 3 x 3 x 3/4", etc.

Style C Cleveland Double End Punch & Shear Arch. Jaw, Capacity Punch 1 1/2" thru 3/4", Shear 1 1/2" Plate, Gearing Motor Drive

No. 2 Hilles & Jones Double End Punch & Shear Capacity Punch 1" thru 1 1/4", Shear 3/4" Plate Style EF Cleveland Single End Punch & Shear Arch. Jaw Capacity Punch 1 1/4" thru 1", Shear 2" Round, 6" x 1" Flat

### RIVETER

100 ton Hanna Air Riveter, 150" Reach, 24" Gap, Capacity 1 1/2" and 1 3/4" rivets

### ROLL—PLATE STRAIGHTENING

7 Roll Bertsch Plate Straightening Machine, Capacity 10" x 3/4", Complete Elec. Equip.

### ROLLING MILLS

7 1/2" Steckel Four High Rolling Mill, Max. Steel Width 6", Work Rolls 2 1/2" x 1 1/2", Complete with electrical equipment

8"x10" Two Stand Two High, Comm. Elec. Equip.  
12"x16" Single Stand Two High, Comp. with Elec. Equip.

15"x30" Mossberg Single Stand Two High  
18"x24" Waterbury Farrel Two Stand Two High  
20"x30" Two Stand Two High Rolling Mill

20"x36" Poole Two Stand Two High  
21"x76" Philadelphia Single Stand Two High  
22"x40" Single Stand Two High  
24"x58" United Two High Roughing Mill

28"x60" Single Stand Two High  
18"x60" Three High Roughing Mill, Complete with billet heating furnace and accessory equipment incl. elec. equip.

### SAWS

No. 3 Motch & Merryweather Cold Saw, Complete with Pump & 10 H.P. Motor  
No. 749 Espen-Lucas Heavy Duty Cold Saw, Capacity up to and incl. cakes or slabs 48" x 7" Stroke 72", Motor Driven

### SHEAR—ALLIGATOR

No. 7 Thomas Carlin Alligator Shear, 16" Blade 30 H.P., D.C. Motor

### SHEAR—ANGLE

Hilles & Jones No. 2 Double Angle Shear, M.D. Capacity 6" x 6" x 3/4"

### SHEAR—BAR AND ANGLE

Buffalo Double End Bar & Angle Shear, M.D., Capacity Squires 4", Angles 8" x 8" x 1 1/4"

### SHEAR—BILLET

Fels Billet Shear, Belted Motor Drive, Capacity Cold 9 1/2" Round, 8" Square

### SHEAR—GATE

96" x 1/2" Birdsboro Shear with Table & Stacker  
SHEARS—MISCELLANEOUS

United "RENDELMAN" Type Rotary Flying Shear Capacity hot steel 1" round, 1" square 3/16" x 3/4" flat, Motor Driven

United Oil Hydraulic Up-Cut Shear Complete with Pump, Motor and Tank 33" Knives, 8" Stroke Pressure Between Knives 360,000# at oil pressure of 2000# per sq. in.

### SHEARS—ROTARY

No. 60 Quickwork Rotary Shear, 3/4" Capacity  
No. 100 Killing Rotary Shear, 1" Capacity  
No. 25A Quickwork Whiting Rotary Shear, 1/4" Capacity, with Circle Cutting Attachment, Motor Driven

### SHEARS—SQUARING

6"x3/4" Niagara 250 Squaring Shear Multiple V belt Drive with 10 H.P., A.C. Motor  
10" x 10 Gauge Cincinnati Squaring Shear, Motor Driven

10"x16" Dreis & Krump Squaring Shear V-belt Drive with 6 1/2 H.P. Motor  
16" x 1/2" Cincinnati Squaring Shear, M. D.

10"x24" Niagara Model 10 1/2 G Squaring Shear, Motor Driven With Motor  
12"x16" Stamco Steel Squaring Shear, Motor Dr.

12"x16" Stamco Steel Squaring Shear, Motor Dr.

12" x 1/4" Steelweld Squaring Shear, Motor Drive. LATE MODEL—LIKE NEW.

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12" x 1/4" Steelweld Squaring Shear, Motor Drive. LATE MODEL—LIKE NEW.

Manufacturing

**RITTERBUSH & COMPANY, INC.**

50 CHURCH ST., NEW YORK CITY 8

Telephone COrtlandt 7-3437

Equipment

Confidential Certified Appraisals

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Consulting Engineering Service

Surplus Mfg. Equipment Inventories Purchased

June 25, 1953

183

# THE CLEARING HOUSE

## MILES' QUALITY

AIR COMPRESSOR, 21"x13"x16" Worthington  
AUTOMATIC, 20"x25" Fay (1942)  
AUTOMATIC, 8" Bullard Multi-Au-Matic, 6-spindle  
AUTOMATIC, 6-spindle Baird Chucker  
AUTOMATIC, 1 1/4" Conomatic 8 spdl Also 1 1/2"  
AUTOMATIC, 2 1/4" & 3 1/2" Conomatic 4 spdl.  
BORING MILL, 4" Detrick & Harvey, horiz. fl. type  
BROACH, No. 1 Foote Burt duplex surface  
BROACH, 12 ton No. V2 American Vertical  
BROACH, 10 ton H1048 American horizontal, 1946  
BROACH, 15 ton 36" stroke Colonial vertical surf.  
BROACH, No. 3XA Oilgear horizontal hydraulic  
BROACH, V42 American hydraulic, 18 ton  
BULLDOZER, No. 22 Williams & White  
COMPARATOR, 20" Portman Optical  
DRILL, Nos. 217, 321 Baker  
DRILL, No. 36 H0 Baker hydraulic  
DRILL, 21" x 24" Cincinnati, upright  
DRILL, 12-spindle No. 12 Natco  
DRILL, 12-spindle No. 10 Defiance rail type  
DRILL, No. B 250 H Natco multiple  
DRILL, 36-spindle Bausch, adjustable spindle  
DRILL, RADIAL, 3 1/2", 8" American sensitive  
GEAR HOBBER, 72" Schuchardt & Shutte  
GEAR HOBBER, No. 12H G&E  
GEAR HOBBER, No. 130 Cleveland Rigidhobber  
GEAR HOBBER, No. 3 Adams Farwell  
GEAR HOBBER, No. 12 Barber Colman  
GEAR HOBBER, type A, Barber Colman  
GEAR HOBBER, Nos. 1 and 25 SA Lees Bradner  
GEAR SHAVER, 12" Red Ring, 1946  
GEAR SHAVER, No. 7 Fellows  
GRINDERS, CENTERLESS, Two No. 2 Cincinnati  
GRINDERS, CYLINDRICAL, Two 10"x18" Cincinnati  
GRINDERS, 10"x36" Norton Semi-Auto  
GRINDER, DISC, 30", No. 8 Badger  
GRINDER, DISC, No. 120 Gardner opposed, 1946  
GRINDER, DISC, No. 228 Hanchett opposed, 1946  
GRINDER, GEAR, 10" Pratt & Whitney  
GRINDER, Internal, Bryant Nos. 5, 16A, 16-2B &  
24-36  
GRINDERS, INTERNAL, Nos. 72A3 and 72A5 Heald  
GRINDERS, SURFACE, 24" No. 25A Heald  
Rotary, late  
GRINDER, SURFACE, No. 78 Wilmarth & Morman  
HAMMER, Nos. 5N & 6B Hazel pneumatic  
HAMMER, 40 lb. Bradley helve  
HONE, Nos. 172 & 2510 Barnes hydraulic  
LATHE, ENGINE, 24"x14", 13" and 12" American  
LATHE, TURRET, No. 6 W&S, G. H. motor-in-hose  
LATHE, TURRET, No. 3A Warner & Swasey, Serial  
502-273  
LATHE, TURRET, 36" Rogers vertical  
LATHE, TURRET, 36" Bullard New Era  
MILLER, 18" Cincinnati automatic  
MILLER, 24" Cincinnati automatic duplex  
MILLER, No. 4-48 Cintl Hydr. Duplex  
MILLER, type 45 Product-O-Matic  
MILLER, 30"x21" x 12" Ingersoll 4-spindle  
planer type  
MILLER, 48" x 20" x 20" Ingersoll planer type  
3 vertical heads  
MILLER, 48" x 36" x 12" Ingersoll planer type  
adj. rail  
MILLER, 84" Ingersoll 6-spindle rotary continuous  
MILLER, THREAD, Type C Hall planetary  
MILLER, THREAD, Nos. 4, 6 and CT 36 Lees  
Bradner  
MILLER, VERTICAL, No. 1 Milwaukee, Timken  
MILLER, VERTICAL, No. 3K Kearney & Trecker,  
1943  
MILLER, No. 36 Van Norman vertical, late type  
MILLER, No. 2 Cincin. Plain, H. S. dial type  
MILLER, UNIVERSAL, No. 3K Kearney & Trecker,  
H. S. dial type  
MILLERNIBBLER, No. 3 Savage rotary  
PLANER, 36"x36"x12" Niles Bement Pond  
PRESS, Nos. 56 & 56 1/2 Toledo  
PRESS, No. 94 1/2 Toledo, dbl. cr., s.s.  
PRESS, No. 245 1/2 Hamilton s.s. tiered frame  
PRESS, No. EGSA Ferracite knuckle joint, 400 ton  
PRESS, 600 ton No. 570 Toledo forging  
PRESS, No. DAB411 Hamilton double action toggle  
PRESS, 100 ton HPM hydraulic  
PRESS, 500 ton Wat. Stillman Hydr., 1943  
RIVETERS, large variety  
ROLL, 20"x3/16" Farnham bending  
SAW, 7" No. 14 Higley cold-cutting  
SAW, 816S Kalamazoo metal cutting band, new  
SLOTTER, 16" Bement Miles crank  
SHAPER, 24" G&E auto oil crank shaper  
SHAPER, 27" Morton draw cut  
SHAPER, 38" throat No. 17F New Duty  
TAPPERS, Two No. 71 Etico  
TESTER, 230,000 inch-pound Timius-Olsen No. 2  
torsion  
TESTER, 100,000 lb. Riehle tensile & compression  
THREADERS, 2" Landis pipe threading and cutting  
THREADERS, Two 3/4" Landis, double spindle  
THREADERS, 2" Oster rotary head  
WELDER, 100 KVA Thompson automatic spot

WRITE FOR CATALOG NO. 195 FOR COMPLETE LISTING

**MILES MACHINERY CO.**  
2025 E. Genesee Ave.  
SAGINAW, MICHIGAN

## RE-NU-BILT GUARANTEED ELECTRIC POWER EQUIPMENT

D. C. MOTORS					
Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	2000	Whse.	Mill	600	230/400
1	940	Whse.	QM	250	130/170
1	900	Whse.		250	450/550
1	600	Al. Ch.		250	400/800
1	500	Whse.	CC-216	600	300/900
2	450	Whse.		550	415
1	400	G.E.	MCF	550	300/1050
2	300	Whse.	CB-5091	230	575/1150
1	200/300	G.E.	MFC	230	360/920
1	200	Rel.	1970T	230	720
1	200	Whse.	CB-5113	230	400/800
1	150	Whse.	CB-2073	230	575/1150
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
1	150	Cr. Wh.	83H-TEFC	230	960
1	150	Whse.	SK-151B	230	900/1800
1	150	Whse.	SK-201	230	360/950
1	50/120	G.E.	MCF	230	250/1000
2	100	Whse.	SK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

## MILL & CRANE

1	50	G.E.	CO-1810	230	725
1	20	Whse.		230	975
1	15	Whse.	K-5	230	630
3	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
3	8.25	W.L.	K-3	230	680
4	3	C.W.	SCM-FF	230	1750
2	3	Whse.	HK-2	230	835

## A.C. MOTORS

3 phase—60 cycle

SLIP RING					
Qu.	H.P.	Make	Type	Volts	Speed
1	1500	G.E.	MT-498	360	320
1	1500	ABB		2300	720
1	1200	G.E.	MF-26	2300	275
2	1000	A.C.	Mill	2300	240
1	500	Whse.	CW	550	350
1	500	G.E.	IM	440	900
1	500	G.E.	MT-574-Y	6000	300
1	400	Whse.	CW	440	511
1	400	Whse.	CW-1218	2200	435
1	350	G.E.	MT-442Y	2200/4000	253
2	300	G.E.	MT-565Y	2300	900
1	300	A.C.	3-Brg	440	505
1	250	G.E.	MT-424-Y	4000	257
1	250	G.E.	MT-5598	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	26QB	415	765
1	200	G.E.	IM-17	440	600
1	200	G.E.	IM	440	1275
1	200	G.E.	MTF	440	1170
1	150 (unused)	Whse.	CW	2300	435
1	150	G.E.	IM-16	440	600
2	125	A.C.		440	865
1	125	Al. Ch.		440	720
4	125	G.E.	MT-566Y	440/2200	435
1	100	G.E.	IM	440	600
5	100	A.C.	ANY	440	695
1	100	G.E.	IM-16	2200	435
1	100	Whse.	CW-568A	440	700

## SQUIRREL CAGE

2	650	G.E.	FT-359BY	410	3570
2	450	Whse.	CS-1420	2300/4150	354
1	200	G.E.	IK-17	440	580
1	200	G.E.	IK	440	865
3	200	G.E.	KT-557	440	1800
1	150	Whse.	CS-8568	440	880
1	150	Whse.	CS	440	580
1	150/75	G.E.	IK	440	900/450
1	125	Al. Ch.	ARW	2200	1750
1	125	G.E.	KF-6328-Z	440/2200	3585
1	125	Whse.	MS	440	485

## SYNCHRONOUS

2	3500	G.E.	TS	2300	257
2	2100	G.E.	ATI	2300	360
2	1750	G.E.	ATI	2300	8600
2	2000	Whse.		2300	120
3	725	G.E.	ATI	2200/12000	600
1	1500	Whse.		2200	450
2	350	G.E.	TS	2200	156

## M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
1	2000	G.E.	500	600	11000
1	2000	G.E.	514	600	6600/13200
3	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	360	275	4400
1	1500	G.E.	600	600	4160
1	1500	C.W.	514	115	4000/12000
2	1000	Whse.	900	600	4160
1	1000	G.E.	900	260	6600
1	1000 (3U)	G.E.	900	250	2200
1	750	Whse.	900	275	4160
1	750	C.W.	514	115	2300
1	600	G.E.	720	250	410/2300
1	500	G.E.	720	125	2300
1	500	Whse.	900	125/250	440
1	500	Whse.	1200	125/250	6600/12000
1	400	Whse.	1200	250	2300
1	400 (3U)	Cr. Wh.	1200	125/250	2300
1	150	Whse.	1200	475	2300
1	150 (3U)	Cr. Wh.	890	125/250	440/2300
1	100	Dr. W.	1200	125/250	2300
1	100	G.E.	1170	125	220/440

## FREQUENCY CHANGER SETS

Qu.	KW	Make	Freq.	Voltagess
1	3000	G.E.	25/60	2300/2300/4000
2	2500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	25/60	11000/2300

**BELYEA COMPANY, INC.**  
47 Howell Street, Jersey City 6, N. J.



King 52" Vertical Boring Mill, one plain and one swivel head on cross rail, DC motor driven with generator set  
King 42" Vertical Boring Mill, 2 heads  
Niles 36-44 Vertical Boring Mill, motor driven, 1 rail and 1 side head  
Niles 42"-50" Burnisher, Face and Box Borer, late type, motorizer  
Norton 10 x 24 Surface Grinder  
Norton 12 x 48 Type C Hydraulic Universal Grinder, late type, complete with internal grinding attachment  
American 4'11" column Triple Purpose Radial Drill, motor driven thru Turner gear box on arm  
American 5'14" Triple Purpose Plain Radial Drill  
American 20" x 14" bed G.H. Lathe, 12 spindle speeds, 96" centers, complete with taper attachment  
Feddick 6'15" Radial Drill  
Fellows 612 Spur Gear Shaper  
Fellows 725 Gear Shaper with Spur Guide  
Cincinnati 24" Back Geared Shaper  
Columbia 28" Back Geared Crank Shaper  
Gould & Eberhardt 16" Back Geared Shaper  
Gould & Eberhardt 24" Back Geared Shaper  
Gould & Eberhardt 28" Back Geared Crank Shaper  
Gould & Eberhardt 32" Back Geared Crank Shaper  
Gould & Eberhardt 96H Gear Hobber  
Gould & Eberhardt 18-H Hobber  
Gould & Eberhardt 60BM Gear Rougher  
Cincinnati #2 Centerless Grinder  
Fitchburg 48" Spline Grinder, late  
Heald #50 Internal Grinder  
Heald #72A3 Internal Plain Grinder  
Heald 70A Internal Grinder, late type  
Heald 78 Centerless, Internal & Cylindrical Grinder  
Norton 12 x 48 Hydraulic Universal Cylindrical Grinder, late type  
Jones & Lamson 8 x 31 Thread Grinder  
Landis 26" x 168" Plain Cylindrical Grinder  
Landis 16" x 72" Plain Cylindrical Grinder  
Oliver Template Tool Bit Grinder  
Sellers 4T Tool Grinder, late type  
Sellers 6T Tool Grinder, late type  
Gisholt IL Saddle Type Turret Lathe, complete with bar feed, late type  
Oster 601 Rapidution Turret Lathe  
Blount Model B-3 Special Application Lathe for turning, chucking, polishing and lapping  
Lodge & Shipley, 16" x 126" centers, Timken bearing, late type, complete with taper attachment  
Lodge & Shipley, 18" x 6" G.H. Lathe, 12 speeds  
Lodge & Shipley 18" x 6" G.H. Lathe, 12 speeds  
Lodge & Shipley 20" x 8" G.H. Lathe, 12 speeds  
Lodge & Shipley 24" x 14" bed G.H. Lathe, 12 spindle speeds, 100" center distance, complete with taper attachment  
American 30" x 14" G.H. Lathe, taper  
Milwaukee 2HL Plain Millar, late type  
Brown & Sharpe #3 Plain Millar 4 SCD  
Hall Style "D" Planetary Millar, late type  
Pond 48 x 48 x 16" Double Housing Planer, DC motor drive, 4 heads  
Bliss #37 Coining Press, 3/4" stroke, 150 ton  
Baker 217 Drill Press  
Rasmussen 6 x 6 Power Rack Saw

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BLISS No. 55 Double Action Toggle Draw Press  
Bed Area 38" x 33", Stroke of Blankholder 10"  
Stroke of Plunger 21", Air Clutch. New in 1945  
BLISS No. 88 Straight Side Single Crank Press  
Capacity 255 tons, Bed Area 30" x 29", 18"  
Stroke of Slide, Marquette Air Cushion.  
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CLEVELAND Double Cranks, 65-G-72, 45-D-60  
NIAGARA Double Cranks, 67C, 68C, 69X, 612C  
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RECONDITIONED

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Box, Steel Sheathed, 40-Ton Capacity

Box, Double Sheathed, 50-Ton Capacity

Box, Single Sheathed, 50-Ton Capacity

Flat, 50-Ton, Steel Underframe, 40'6" Long

Hoppers, All-Steel, 70-Ton, Triple Hopper, Cross Dump

### EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

70-Ton Capacity, Length 60'0", All-Steel, Fish-belly Underframes

### STANDARD GAUGE AIR DUMP CARS

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End Dump, 20-Yd., 50-Ton, Drop Door

Side Dump, 30-yd, 50-Ton, Drop Door

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10,000 Gallon

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Tank, 8,000-Gallon, Coiled and Non-Coiled

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Eight Wheel, Cupola Type

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Jordan Spreader

Locomotive Cranes

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### PLAIN CYLINDRICAL GRINDERS

6x15" Cincinnati Plain Hydraulic, m.d.  
6x18" Landis Plain Self-Contained, m.d.  
6x18" Landis Type C Hydraulic, m.d., late  
6x30" Cincinnati Hydraulic, m.d.  
10x30" Cincinnati Light Type Model OE, Hydraulic  
10x36" Cincinnati Hydraulic, m.d.  
10x48" Cincinnati Plain Hydraulic, Model ER, m.d., latest  
10x72" Landis, m.d.  
10x72" Norton, motorized  
12x36" Landis, m.d.  
12x96" Landis Plain Self-Contained, m.d.  
14x18" Cincinnati Plain Self-Contained, m.d.  
14x48" Cincinnati Plain Self-Contained, m.d.  
14x52" Norton, motorized  
16x72" Landis Plain, m.d.  
No. 20—10x18" Brown & Sharpe, m.d.  
10x120" Landis Plain Self-Contained, m.d.

### DISC GRINDERS

No. 2 Gardner, belted, m.d.  
No. 151 Besly, m.d.  
Hammond Disc Grinder, Model No. 600  
Model V10 Hammond Belt Sander, m.d.  
No. 4 Gardner Disc Grinder, m.d.  
No. 20 Gardner Comb. Disc Grinder & Roll Sander, m.d.  
7 1/2 H.P. U. S. Elec. Tool Co. Disc Grinder, m.d., new  
No. 124—53" Gardner, m.d., vee belt

### EMERY GRINDERS

3 H.P. Baldor Pedestal Type, 32M, new  
5 H.P. U. S. Elec. Tool Co., latest  
#516 Mummert & Dixon Radial Emery Grinder, m.d., 5 H.P. motor

### UNIVERSAL CYLINDRICAL GRINDERS

No. 3 Brown & Sharpe Universal Grinder, m.d.  
6x20" Fitchburg Hydraulic Spline & Gear Grinder, m.d., latest  
16x24" Cincinnati Self-Contained, m.d.

### CYLINDER GRINDERS

No. 50 Heald Hydraulic, m.d., 11—18" spindles  
No. 55 Heald, m.d., 15—24" spindles  
No. 73 Heald Airplane Cylinder Grinders, brand new, m.d.

### INTERNAL GRINDERS

No. 16—22" Bryant, m.d., latest  
No. 16RS Bryant, m.d., latest  
No. 16—38" Bryant, m.d., latest  
No. 24—21" Bryant, m.d.  
No. 44 Heald Facing Type Borematic, m.d.  
No. 72 Heald Sizematic, m.d.  
No. 72A Heald Sizematic "Duplex", m.d.  
No. 72A Heald Gagematic, m.d.  
No. 72A3 Heald Sizematic, m.d.  
No. 72A5 Heald Gagematic, m.d.  
No. 72A5 Heald Plain, m.d.  
No. 73 Heald Airplane, m.d., latest, new  
No. 74 Heald, m.d.  
No. 81 Heald Gagematic, Sizematic, m.d.  
No. 649—16" Van Norman Automatic Oscillating Radius, m.d., latest  
No. 5 Bryant, m.d., latest

### SURFACE GRINDERS

No. 2B Brown & Sharpe, m.d.  
No. 2 Brown & Sharpe, m.d.  
After Model A-1-3" Rotary, m.d., latest

No. 16—26" Blanchard Vertical, m.d.  
No. 121 Hanchett Production Face Grinder, type BD, m.d.  
No. 22—12" Heald Rotary, m.d.  
No. 33 Abrasive Vertical, m.d.  
No. 260—162 Heald Rotary, belt  
14" Pratt & Whitney Vertical, m.d.  
Model DA—12" O.S. Walker, m.d., latest  
Delta Toolmaker Surface Grinder, m.d.

### TOOL & CUTTER GRINDERS

Gisholt Universal Tool Grinder, belt  
No. 45 Fellows Helical Cutter Sharpening Machine, m.d.  
Union Twist Drill & Cutter Grinder  
Type 05D Sellers Drill Grinder, m.d.  
No. 0-2 GP Sellers Drill Point Thinning Machine, m.d.  
Grand Rapids Tap Grinder, style 12M  
Gleason Cutter, belt drive  
No. 2A Wm. Sellers Universal Tool Grinder, m.d.  
No. 2B Sellers Wet Grinder, m.d.  
No. 2 Lumsden Oscillating Tool Grinder, belted, m.d.  
No. 4T Sellers Tool, m.d., latest  
No. 1 J & B Tap Grinder, m.d.  
Pratt & Whitney Deep Hole Drill Sharpener, m.d., latest  
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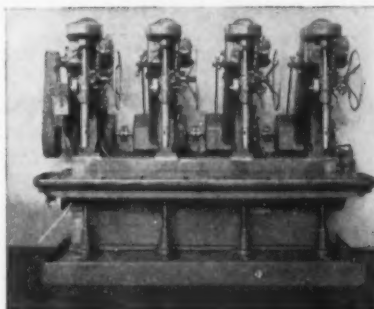
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BARNES H-2 Hydram Drill; cap. 2"; swing 22".  
FOOTBURN 6-spindle Drill; fixed head; table dia. 32".  
LeMAIRE 5-spindle Drill; square table; twin ram in head.  
MOLINE 6-spindle Boring Machine; adj. rail; M.D.  
NATCO #14 Adj. Multiple Spindle Drill; bored for 24 spindles.  
CINCINNATI BICKFORD 6-ft., 15" column, Univ. Radial Drill.



BARNES 20"—4-spindle Camel Back Drill, M.D., late

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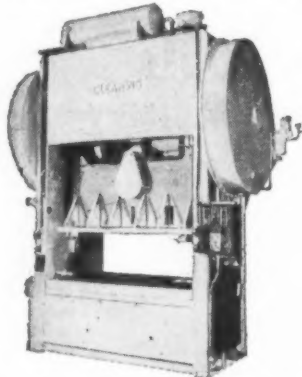
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30" MORTON Hydraulic Keyseater, 30" stroke, complete hydraulic mechanism, new 1942.  
600 Ton CHAMBERSBURG Cast Steel Frame Inclined Type Hydraulic Wheel Press, 96" between strain bars, AC-MD.

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6D Automatic Potter & Johnston Chucker—Serial #70393—Reconditioned and guaranteed.  
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Rebuilt No. D-8 Colburn Heavy Duty Drill Press—Rebuilt and guaranteed—Serial #155.  
Rebuilt No. 314 Baker 24" Heavy Duty Drill Press—Serial #2-4598.  
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Ingersoll Vertical Milling Type Planer, 12' x 42" table x 12" stroke, 3 vertical heads, 440/3/60 AC  
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Buda Engine—DC Generator, Rubber Tired  
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190 Ton Birdsboro Hydraulic (Oil) Ingot Stripper, Vertical Type, Stationary—220-440/3/60 AC  
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Guillotine Shears 1 1/2", 2", 3", 3 1/4", 1 1/2", 2", 3", 4" Ajax Upsetters, Suspended Slides.  
National Upsetting and Forging Machine, 4".

Ajax and Acme Upsetting and Forging Machines, Not Suspended Slides, from 1" up.

No. 3 Ajax Forging Roll. Also Ajax Brake Shoe Key Roll.

W. W. Bulldozers, #22, #3, #4, #25, #6.

6000 Lb. Chambersburg Double Frame Steam Forging Hammer.

4000 Lb. Niles Bement Double Frame Steam Forging Hammer.

Chambersburg Board Drop Hammers, 800 Lb., 1200 Lb.

Nazel Air Forging Hammers, #4-B, #5-N, #6-B.

Bradley Hammers, Cushion Helve, Upright and Compact.

Multiple Punch, #30-A W. W. 600 tons. Multiple Punch, Size G. L. & A. 940 tons.

Southwark Single End Punch, 315 tons, 48" throat, Gag Sockets, Arch. Table.

Single and Double End Punches, various capacities.

Angle Shears, Pels & H. & J., 6"x6"x 3/4". #3 Ryerson Friction Saw.

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300 Ton Oilgear High Speed 2-Column Hydraulic Press, stroke 18", ram 27"x23".

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600 Ton R. D. Wood Inclined Hydraulic Locomotive Wheel Press, also 400 ton Wheel Press.

Tensile Testing Machines—50,000, 100,000, 200,000.

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**BOLT, NUT & RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.**

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WORLD'S LARGEST STOCK

new and rebuilt —  
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**JUNE SPECIAL**  
180 ton Bliss Double Crank, 60" wide  
MANY OTHERS—  
SEND FOR CIRCULAR!  
**HYMAN**  
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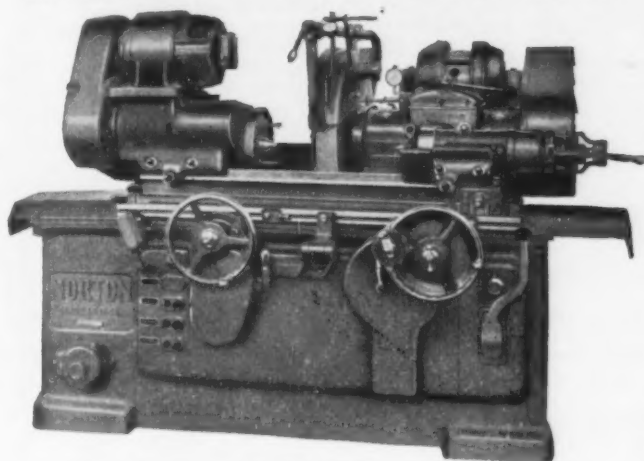
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**BLISS HIGH PROD. PRESSES**  
#630 45 Ton & #650 75 Ton 1" Strokes  
Double Roll Feed & Scrap Cutters LATE TYPE  
**PLANERS DOUBLE HOUSING**  
Niles-Bement-Pond 36" x 36" x 8' 2 Hds on C.R.  
One Side Head  
Whitcomb 24" x 24" x 8' 2 Hds on C.R.  
Whitcomb 28" x 28" x 10' 2 Hds on C.R.  
(3) 25 Ton Henry & Wright Dicing Presses  
(All in GOOD OPER. CONDITION)  
**SEABOARD STEEL CO., INC., 10 Fair St., New Haven, Ct.**

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LATE TYPE MACHINES FOR SALE OR RENT

10" x 36" NORTON TYPE C PLAIN CYLINDRICAL GRINDER



Serial 17771

All self-contained motor drive with individual head and driving motors  
Automatic and head feeds to table  
Motor driven hydraulic pumping system  
Push button control

## Engine Lathes

14"x30" Hendey—1942  
18"x30" Monarch—1942  
20"x36" Sidney—1932  
20"x72" Reed Prentice—1925  
22"x168" Lodge & Shipley—1947  
30"x96" Monarch—1937  
54"x18" Houston, Stanwood & Gamble—1920

## Turret Lathes

2—3 Gisholts, Bar and Chuck—1943  
2—4 Warner & Swasey, Bar & Chuck—1942  
7 Bardons & Oliver, Bar & Chuck—1940  
3—1 L Gisholts, Bar & Chuck—1932-42  
1A Warner & Swasey, Bar & Chuck—1942  
21B Bardons & Oliver, Bar & Chuck—1945  
3L Gisholt, Chuck—1942  
4A Warner & Swasey, Chuck—1942

## Production Lathes

2—15"x30" Lipe Carbo-Matic—1942  
2—16"x33" Fay—1943  
20"x25" Fay—1948  
16AL LeBlond—1940  
8"x108" Le Swing—1947

## Horizontal Boring Mills—Table Type

3" Universal—1925  
3" Feedick—Excellent Condition—1924  
3 1/2" Universal—Excellent Condition—1925  
32 Lucas—Excellent Condition—1926  
330-T Giddings & Lewis—1940  
**Vertical Boring Mills**  
24" Bullard—1926  
42" Bullard—1928  
42" King—2 heads in rail, Side Head—1932

42" Bullard Cutmaster—1947  
54" Bullard—1930  
64" Bullard—1933

## Milling Machines, Horizontal, Vertical and Plain

2H K & T Plain Horiz.—1943  
3H K & T Plain Horiz.—1943  
3B K & T Plain Horiz.—1929  
3K K & T Plain Horiz.—1943  
3V Van Norman Vert.—1942  
3H K & T Vert.—1942  
1854 K & T Simplex Prod. Mill—1943  
1402 K & T Simplex Prod. Mill—1932

## Grinders

35 Ex-Cello Precision Thread Grinder—1942  
10"x16" Norton Type C Plain Cyl. Grinder—1942  
84" Lumsden Vert. Rotary Surface Grinder—1940  
72A3 Heald Sizenatic Internal Grinder—1943  
72A3 Heald Extended bed, Internal Grinder—1943  
72A Heald Internal Grinder—1943  
3B Abrasive Surface Gr.

## Late Type Miscellaneous

12" 6-Spindle Bullard Type D Multitatic—1943  
Hammond Radial Drill & Tapper—1942  
24" Cleerehan Heavy Duty Drill—1942  
Type A Barber-Colman—1942-47  
7125A Fellows Gear Shaper—1943  
61 Fellows Gear Shaper—1943  
61A Fellows Gear Shaper—1943  
665 Toledo Knuckle Joint Press—1934  
Type A Barber-Colman 24" Extended Bed—1937  
20" Glen. Heavy Duty Shaper—1943

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3—BELLEVUE (round-type) furnaces equipped for gas. Capacity 700 lbs. zinc. Outside dimensions 34" dia., 25 3/4" high. Price \$350.00 each.

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### MANUFACTURER

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### RAM

36 1/2" Dia., 36" stroke

### NO. OF POSTS WITH CENTER LINE SPACE

4 posts 8-11/16" diam., 35 1/2" left to right, 21 1/2" front to back

### DAYLIGHT OPENING

89 7/8"

### SIZE OF STATIONARY PRESSURE PLATE

Bottom pressure plate: 30" left to right 32 1/2" front to back

### PRESSURE PLATE ON RAM

32" left to right, 42" front to back

### TYPE OF PUMP EQUIPMENT

2—28.2 G PM Northern Radial piston (one is spare)  
1—19.2 G PM Servo Piston type

### MOTORS

1—50 H.P. 440 V G.E. induction, for applying pressure  
1—3 H.P. 440 V G.E. induction, for controls

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- 1—34" x 22" x 100" 3-HIGH PLATE MILL with 3000 HP motor drive, vertical edger, two tilting tables.
- 1—4-HIGH REVERSING COLD STRIP MILL with D.C. electrical equipment.
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- 1—603 HP GEAR DRIVE, ratio 203 to 25 RPM.

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- 1—72" BACKED-UP ROLLER LEVELLER.
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- 1—SHEET SQUARING SHEAR, capacity 144" x 3/16".
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- 1—1500 HP MOTOR, 507 RPM, 2300/3/60.
- 1—153 HP MOTOR, 400 RPM, 2200/3/60.

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- 24 ton Plymouth Gas 0-4-0 std. ga.
- 10 ton Davenport Gas 0-4-0 std. ga.
- 8 ton Plymouth Gas 0-4-0 std. ga.
- 70 ton flat cars 40'6" std. ga.
- 50 ton flat cars 40'6" std. ga.
- 70 ton Gondola cars 41'3" std. ga.
- 50 ton Gondola cars 40' std. ga.
- 50 ton all steel twin hoppers std. ga.
- 40 ton double sheathed box cars std. ga.
- 40 ton single sheathed steel sheathed box cars std. ga.
- 20 yd. Koppel dump cars std. ga.
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Car Repair Parts  
For All Types of  
Railroad Equipment

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Requires ground area—8 ft. wide x 25 ft. long. Extra 2000 C.F.M. available if used with above blast room. Complete with collector, support, exhaustor, fan house, motors and controls. Wired for 3/60/220 current. Built by Pangborn. Weight—18,240 lbs. 2 years old. EXCELLENT CONDITION. IMMEDIATE DELIVERY.

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- 5 Ton—Detroit—32'6" span—220-440/3/60 AC
- 10 Ton (Ram & Hoist) Alliance—Soaking Pit Charging 61' span, 230 volt DC
- 10 Ton—Bedford—23'9" span, 220/3/60 AC
- 15 Ton—Milwaukee—57'2" span, 230 volt DC
- 15 & 5 Ton—Morgan—52' 10 1/2" span, 230 volt DC
- 25 & 5 Ton—P & H—60' span, 440/3/60 AC
- 30 & 5 Ton—Shepherd—48'7" span—230 volt DC
- 30 & 5 Ton—Northern—75' span—220/3/60 AC
- 30 Ton—Milwaukee—58' 4 7/16" span, 440/3/60 AC
- 125 & 10 Ton—Cleveland—Dual Trolley—64'6" span, 230 volt DC
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2-Type A, 4 blocks 22", 5 dies, 50HP DC motor and controls 1-Type B, 6 blocks 16"-22", 7 dies, 60/75 HP DC motor and controls.

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ENGINEERED AND REBUILT BY SPECIALISTS IN OUR MODERN PLANT

### DIRECT CURRENT MOTORS

Qu.	HP	Make	Type	RPM
1	1000	Whas.	Encl. (Rev.)	600
1	1000	Whas.	Encl. (Rev.)	600
1	1000	Whas.	Encl. (Rev.)	600
1	1000	Whas.	Encl. (Rev.)	600
1	1000	Whas.	Encl. (Rev.)	600
1	1000	Whas.	Mill	68/74
1	1000	Whas.	Mill	285/730
1	1000	G.E.	MCP-80	350/450
1	350	G.E.	CD-169	1150
1	250	G.E.	MPC-8	325/875
1	200/250	EL. Dy.	Size 22	400/1200
1	200	Whas.	Mill	300/1200
1	200/250	G.E.	MPC	300/900
1	180	G.E.	MPC	400
1	125	Whas.	SK-190	600
1	90/180	G.E.	MPC	625/1125
1	125	Whas.	SK-184	575/850
1	75	G.E.	CD-123	500/1000
1	60	EL. Dy.	25-8	450/900
1	50	G.E.	RF-16	300/900
1	50	Whas.	SK	250/1000
1	40	Whas.	SK-140	600/1700
1	35	G.E.	RF-14	500/1500
1	35	G.E.	CD-125	400/1200
1	35	G.E.	CD-147	300/1200
1	35	Reliance	35-P	250/1200
1	32 1/2	Whas.	SK-150	400/1200
1	30	G.E.	CDM-105	875/1750
1	30	Whas.	SK-110	1800
1	27 1/2	EL. Dy.	15-5	450/1250
1	25	Whas.	SK-123	500/1500
1	25	G.E.	CD-123	400/1200
1	25	Whas.	SK-140	400/1200
1	25	Whas.	SK-111-L	250/1000

All above are 230-VDC except where marked \*\*\*

\*\*\*Pedestal bearing mill type 625/600-VDC

\*\*\*Pedestal Bearing 280-VDC

### MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	Volts D.C.	Volts A.C.
1 (3-unit)	2400	Whas.	720	600	4800/2400
1	1500	G.E.	600	600	4160/2300
1	1000	Whas.	514	600	11,000/6600
1	1000	G.E.	514	600	11,000/6600
1	750	Whas.	800	250	4160/2300
1	500	C.W.	720	375	220/440
1 (2-unit)	500	Whas.	1200	125/250	440
1	400	C.W.	1200	125/250	440
2	250	Whas.	1200	125/250	2300/440
1	200	Whas.	1200	275	4000/2300
1	200	Whas.	1200	125/250	4000/2300
1	155	G.E.	720	350	2300/440
2	150	Whas.	1200	125/250	440
1	100	Deleo	1200	125/250	440/220
1	100	Ridgeway	1200	275	4000/2300
1	100	C.W.	1200	125	440/220
1	85	C.W.	1200	250	440/220
1	75	ALCh.	900	250	2200
1	75	Whas.	900	240	2300
1	25	Ideal	1750	125	440/220
1	25	ALCh.	1200	250	440/220
1	20	ALCh.	1200	250	440/220
1	15	ALCh.	1200	250	440/220

### SLIP RING MOTORS-CONSTANT DUTY

Qu.	HP	Make	Type	Volts	RPM
1	1800	G.E.	MT 498	2300	357
1	1200	G.E.	MT 50	2200	277

Motor Generators of modern design, complete with control—still on their original foundations—available for immediate shipment.

(3)—G.E. 1500-KW, 250-VDC, 514 R.P.M., spd., interpole, pole face windings, 2100-HP syn. motors. 3-P, 13,200-V, 3-P, 50-cy. Will re-connect to 6600-V, or 4160-V.

Qu.	HP	Make	Type	Volts	RPM
2	1000	AL Ch.	ANY	2300	225
1	800	G.E.	MT	2300	440
1	700	Whas.	CW	2300	720
1	600	G.E.	MT 20	2300	300
1	500	AL Ch.	ANY	2300	514
1	500	G.E.	I-16-H	2300	450
1	400	G.E.	MT 418	2300	440
1	250	Whas.	CW 937	440	1300
1	250	AL Ch.	ANY	440	720
1	250	G.E.	MT 114	2300	300
1	125	Whas.	CW 870	2300	900
1	100	Whas.	CW 760	440	1200
1	100	F.H.	H 20 C	440	900
2	100	G.E.	I-15A-M	2300	514

### SQUIRREL CAGE MOTORS 3 Phase-60 Cycle

Qu.	HP	Make	Type	Volts	RPM
1	400	Cont.	NZ-808	2300	1200
1	400	G.E.	I-K	2300	514
1	400	G.E.	KT-412	2300	450
1	300	Whas.	CS-390	2300	1780
1	300	Whas.	CS-875-C	2200	1200
1	200	AL Ch.	ARY	440	600
2	125	AL Ch.	AR	2200	1750
1	125	AL Ch.	AR	2200	514
1	125	C.W.	126-Q	440	430
1	100	Whas.	CS-603-C	440	1750
1	100	AL Ch.	AR	550	720
1	100	Whas.	CS-938	2200	514
1	100	F.M.	H-241	440	450

### TRANSFORMERS (Power)

Qu.	KVA	Make	Type	Phase	Voltage
3	250	Packard	A	1	13200-2200
3	150	Packard	A	1	2300-230/460

3-833-KVA Westinghouse O.I.S.C. transformers, type S, one phase, 60 cycle, still on original foundation. primary 66,000 Volts with (4) 2 1/2 % taps below. secondary 2300/4160-V. Can ship immediately from location.

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10 Ton Champion overhead crane, 95' span or less will furnish rebuilt for 440/220 volt, 3 phase, 60 cycle or 230 VDC, high speed particularly adaptable for outdoor service, 45' lift.

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88' 4" span; 47' 6" lift

230 volts D C

Speed per minute (feet), hoist 40, bridge 400, trolley 200.

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5-ton NEW P&H 48'4" span, 3-motor, 220/3/60 cy. Floor controlled.

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2-10-ton Shaw, 67'1" span, 3-motor, 230 VDC cab.

1-15-ton Milwaukee, 57'2" span, 3-motor, 230 VDC cab.

1-35-ton Northern, 5-ton aux. 75'8" span, 220/- 3/60 cy. cab.

1-75-ton Morgan Ladle Crane, 25 ton aux. 4 girder 49'-6" span, 230 VDC cab.

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35 Ton CLEVELAND, Hand Oper. 41' 10" Span.  
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High Frequency—Arc Type  
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Multiple Punches — all sizes from 100 ton up

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**OVERHEAD ELECTRIC  
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### WEISS STEEL CO. INC.

600 WEST JACKSON BLVD.  
CHICAGO 6, ILLINOIS

Buyers of Surplus Steel Inventories  
34 Years of Steel Service

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**ARNOLD HUGHES COMPANY**

765 PENOBSCOT BLDG. DETROIT, MICH.  
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**GOOD USED ROLLING MILL EQUIPMENT**

One—18" three high roughing mill and 14" three high finishing mill for rolling structural shapes.  
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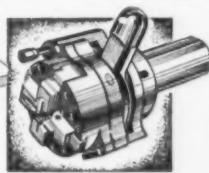
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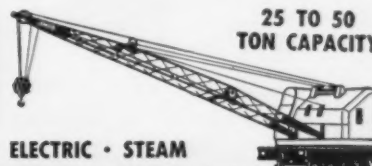
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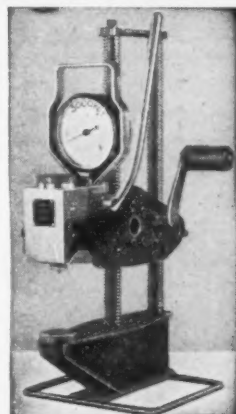
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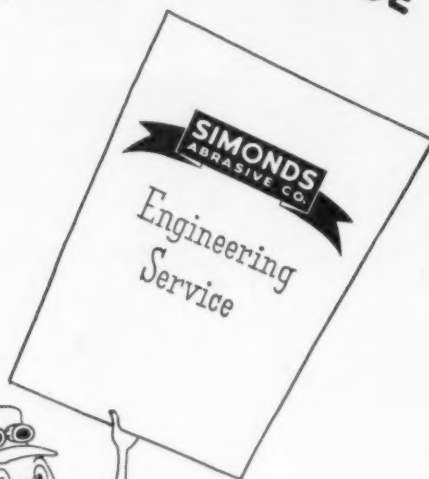


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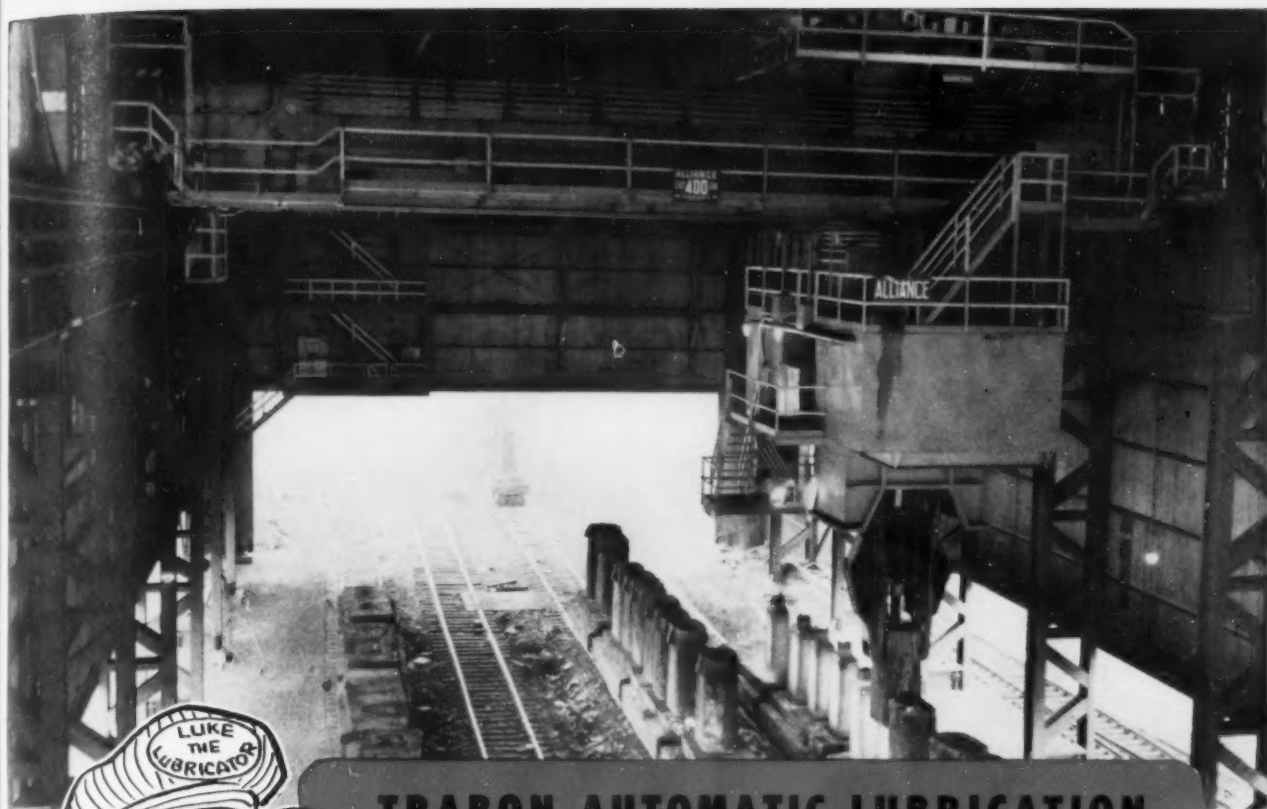
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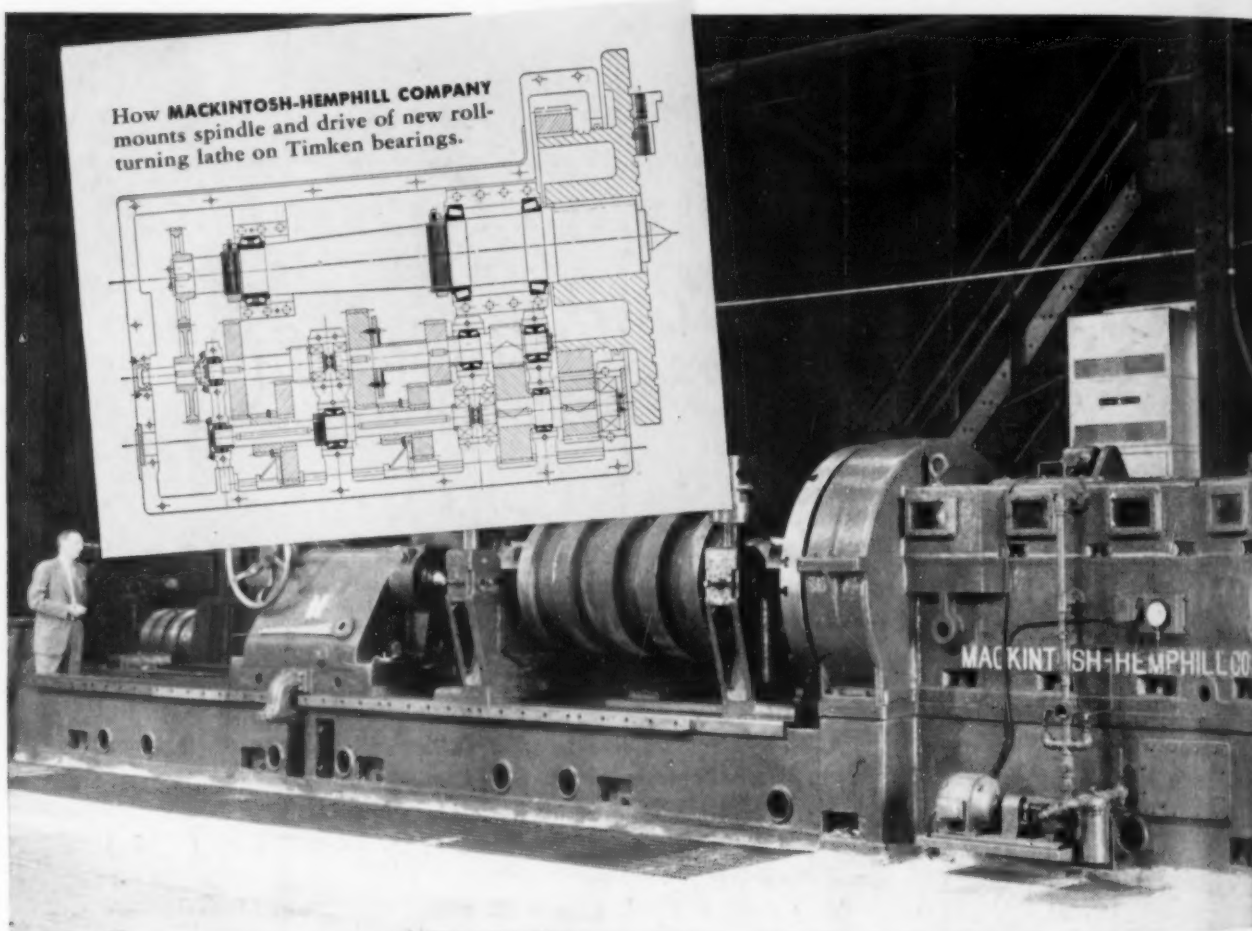
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